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SPACE VOYAGER

PATRICK MOORE—CONSULTANT EDITOR

2010
FULL COLOUR PREVIEW

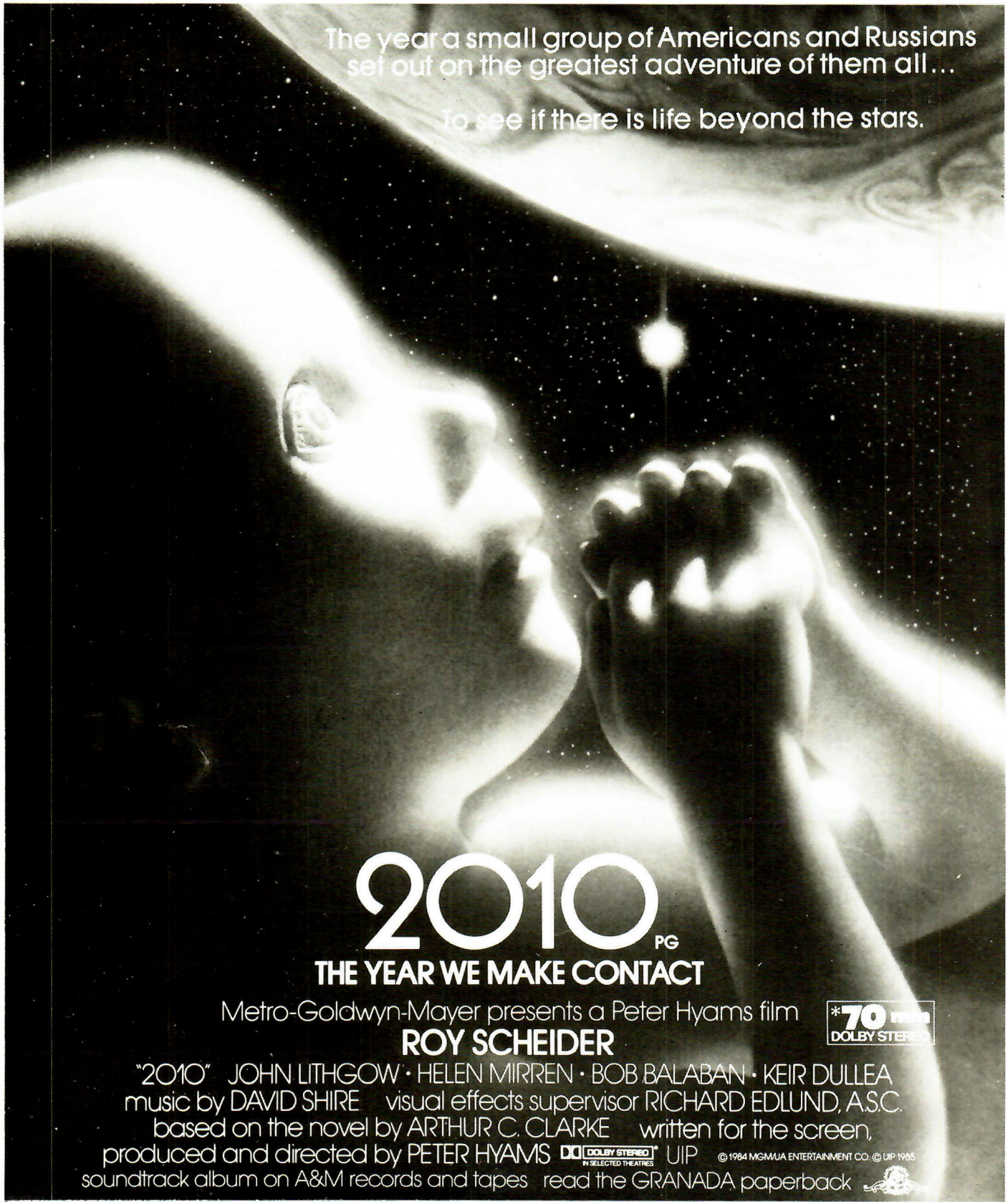
DUNE
FRANK HERBERT IN DEPTH

IRAS SATELLITE
INFRA-RED REVELATIONS

JUPITER'S Io
THE FACTS BEHIND THE 2010 STAR

Plus

MODELLING
STAR WARS EXECUTOR


The year a small group of Americans and Russians set out on the greatest adventure of them all...
To see if there is life beyond the stars.
2010
PG
THE YEAR WE MAKE CONTACT
Metro-Goldwyn-Mayer presents a Peter Hyams film
*70 mm DOLBY STEREO
ROY SCHEIDER
"2010" JOHN LITHGOW · HELEN MIRREN · BOB BALABAN · KEIR DULLEA
music by DAVID SHIRE visual effects supervisor RICHARD EDLUND, A.S.C.
based on the novel by ARTHUR C. CLARKE written for the screen,
produced and directed by PETER HYAMS DOLBY STEREO IN SELECTED THEATRES UIP
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soundtrack album on A&M records and tapes read the GRANADA paperback

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On the cover:
Our main cover shot this month features 2010, the sequel to Arthur C Clarke's classic 2001, previewed in this issue. Inset: Io, Jupiter's fiery moon is under inspection on page 50. Back cover: Stingray, *from the Early Anderson. Contents photo, voice artistes are Nicholas Parsons and Kenneth Connor.*

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CAPTAIN'S LOG

Trains of thought are strange things. You can start in one place and your mind can go chuff-chuffing off in the oddest of directions. Take just now – What is the connection between *Space Voyager*'s readers who live outside Britain and where this planet is in relation to the Universe?

Bear with your Captain's convolutions! You see, I started by thinking just how great it is that *Space Voyager* sells round the world, and how circulation is growing, not just in Britain but everywhere, so that in many countries with different races, religions and ways of life, there are people who think in a way that is enough like ours to want to shell out the money to buy their copies.

So I have very much in mind, when I am writing and compiling *Space Voyager* that there are those readers out there. *Space Voyager* is a British magazine – we can't help but be, for I am British, the other crew members are British and much of the writing is British – though not all of it, and I like to put down in print that Britain does do quite a lot towards astronomy and space research, as well as SF, in books, films and TV. But I also keep in mind that we are an international magazine, which is why we have writers from overseas, writing about things in their countries.

While we believe in our own countries it would be good to believe – and I do believe – that we *Space Voyager* people also know that we are residents of Sol III – Terra – an insignificant planet at the end of one of the spiral arms of one of the Galaxies of this large Universe.

That is where SF comes in really, as a siding on this thought train. For SF has shown us the way, with its postulations of different futures for mankind. We are, through the creations of SF writers, able to sample and evaluate what sort of future we want. And that is where we are all so lucky to be living at this particular time.

I don't claim that *Space Voyager* is going to be solely responsible for creating a new world diplomacy of co-operation, but it is good to reflect that we are crossing those boundaries, we are all interested in Space, both fact and fiction and, through the choices we make on the alternate futures, maybe we will make a difference.

After all, which future do we want – *1984* or *Star Trek – Dune* or *Blakes 7*?

It is no use saying we don't have a choice, we do. Not just through the ballot box, if we are able, but also through magazines like *Space Voyager*.

The signs are there, glimmering, that the global village mentality, which is something with which all *Space Voyager* people are familiar is seeping upward. Russia and America have announced tentative plans for a joint mission, and both nations fly men from other countries on their missions into space. Data from Earth resource satellites is sold cheaply by the country owning the satellite, and other satellites enhance our communications between nations. Britain is just one of the countries invited to co-operate in plans for a space station. Perhaps it will be economic factors which force nations to co-operate but at least they will.

Let us also hope that space can be kept free from politics. When it comes down to it, Earth and the heavens above us are the responsibility of all of us. If we can't solve our problems on Earth do we have the right to go into the Universe?

Welcome Patrick

Anyway, enough of this (hopefully) stirring stuff.

We at *Space Voyager* are more than simply delighted to welcome Patrick Moore into the crew as our Consultant Editor. Patrick will be writing his regular feature articles for each issue, and in addition, from this issue he will be commenting on matters and chronicling his worldwide activities as a renowned astronomer.

Also new on board is well-known writer Duncan Lunan. Duncan will be compiling monthly star maps for us, so that we can all keep tabs on what is happening in the night sky, as well as contributing occasional features.

What else is there in this issue? Neil Gaiman takes an in-depth look at the Christmas film *Dune*, the author, his books, the producers and the cast to supply us with a *Duniverse*.

Still on films we have previews of the German film, *The Neverending Story*, and *2010*, due out at the end of the month. Tying in with this is Aldo Rabaiotti's look at Io.

Andy Nimmo carries on with his series explaining how you can work in space, and we have a trip down memory lane with David Nightingale looking at the early work of Gerry Anderson.

There's modelling, news, book reviews, product information and competitions with some smashing prizes.

The Regular

But one mustn't become so dazzled by this wealth of content that one forgets the regular bit of business which appears at the end of the Captain's log . . . The Caption Contest. Below is your photo for this issue. Get your imaginations round the photo of Marc Singer and friend, taken on the set of *V* and tell us what you think Mike Donovan – or his colleage – is or are saying. Send your entries to the editorial address on page 3, by May 1.

The entry which most appeals to my rather silly sense of humour will win a year's subscription to *Space Voyager*.

Addendum

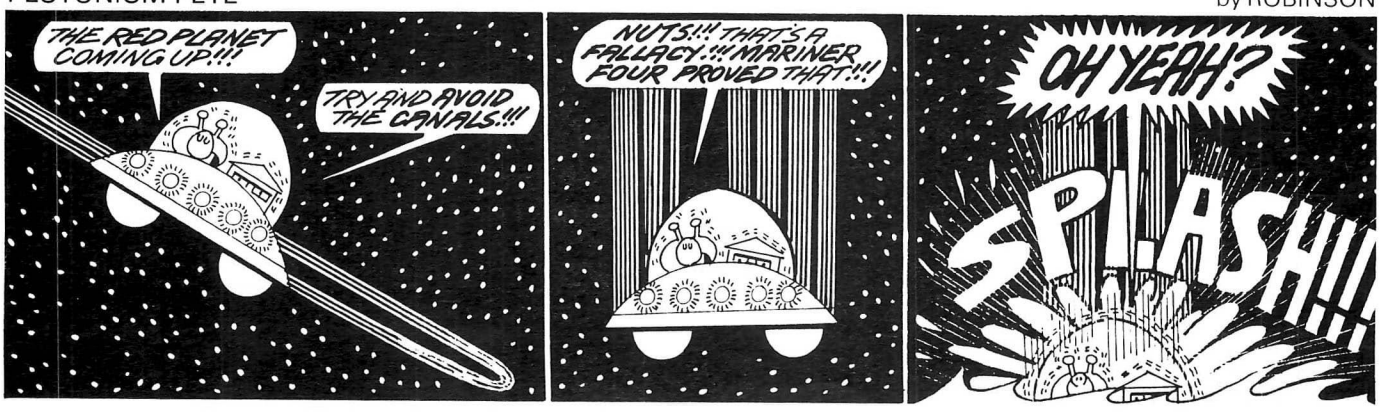
It seems the Gremlins were at work last issue – having burned the midnight oil we must have inadvertently fed one of them and it ate some captions! Therefore, to make amends, here are the missing items:

Page 41, column 2, the missing line reads of light, and thirdly, exposures of shorter' . . .

Page 10, the portrait of Mark Strickson was drawn by Chris Butler.

Cover, the main cover picture, and those on pages 19 and 22, were by Paul Doherty. 'The World for Diana' on the outside back, comes from the Chris Richmond collection, and the inside back cover, of course, features Sting in a scene from *Dune*, reviewed this month on page 24.

PLUTONIUM PETE by ROBINSON



DATA BANK

Giotto testing

British Aerospace's Giotto spacecraft, built to intercept Halley's Comet when it approaches the Earth in 1986, has safely returned from a journey into space – or at least, a simulated voyage.

BAe and the European Space Agency have finished thermal testing of the £35 million Giotto and have confirmed that it's suitable for the eight-month mission.

At the Toulouse Space Centre, Giotto was spun in a vacuum chamber for 15 days and baked by xenon lamps and heaters to the extreme temperatures the satellite will experience in the glare of the sun, in the close encounter with the Comet's tail, and during the Ariane rocket launch.

To make sure it will not fail, Giotto was then subjected to a 12-day thermal vacuum test where it was heated and chilled hotter and colder than anything it should experience in space.

In another test Giotto was subjected, in a special acoustic chamber, to rocket engine noise louder than the human body can tolerate.

It was also shaken more violently than it will be during the rocket lift-off.

In April Giotto will be shipped to the Kourou, French Guiana, launch site.

Courageous Trek fan

Space Voyager records with sadness the recent death of one of the most courageous of SF fans, Doreen Ilines.

Doreen was a familiar figure at conventions. She loved Star Trek and she loved the fans. Doreen was the lady who came to conventions in an ambulance, moved around in a motorised wheelchair and could only breathe with the aid of bottled oxygen; in the evenings she would go to the local hospital to sleep in an iron lung. Doreen could be seen at nearly every fancy dress parade in some beautiful costume – usually with a St. John's man walking along behind helping to carry the oxygen. Sometimes she used her wheelchair as part of her costume, as when, at one convention she entered the Fancy Dress as *The Ship Who Sang* (after the book of the same name by Anne McCaffrey). Sometimes, when she was feeling stronger, she would actually get out of the chair and walk onto the stage.

Space Greenhouse

Boeing Aerospace Company researchers are studying design concepts for an onboard Space Station greenhouse that would enable astronauts to grow their own food. The research is being conducted with a year-long $95,000 contract from NASA's Ames Research Center, Mountain View, California.

Mel Oleson, a life sciences analyst with Boeing, says several designs are being studied. Each design must take into consideration power, mass, volume, cost, reliability, maintainability, accessibility, training ease, and safety. But can large quantities of vegetables be grown in a zero gravity or partial gravity state? Oleson admits there are no guarantees.

'We think that some plants will grow in zero gravity, and that some will grow in partial gravity,' Oleson said. But until actual experiments are conducted in such an environment, he said that 'we don't know for certain whether any sustained growth will occur'.

The Soviets, Oleson noted, are rumoured to have experimented with their own 'space garden' of onions, tomatoes, marigolds and celery.

Prize winners

Lots of competition winners this issue. First off, the Caption competition, which featured a dyspeptic-looking Admiral Kirk. The caption which most appealed to the Editor had an off-camera Dr McCoy saying to the Captain 'Bitten fingernails aren't all that terrible, Admiral'. And that was sent in by Simon Goodall, of Westerham in Kent, who wins a year's subscription to *Space Voyager*.

Winner of the *Crosstrap* game is John Butcher of the aptly named Kilwinning, in Ayrshire, Scotland, who supplied all five answers correctly.

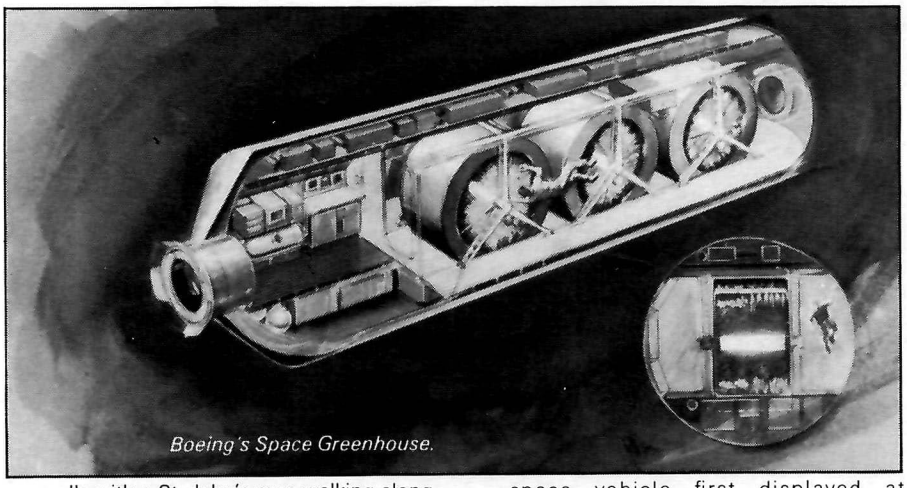
1. What is the name of the proposed British space vehicle first displayed at Farnborough Airshow?
   Hotol – Horizontal Take Off and Landing.
2. When is the centenary of the setting up of the Greenwich Meridian?
   1984.
3. Who played Mike Donovan in the TV series *V*?
   Marc Singer.
4. How much did UFP *Star Trek* Convention raise for charity?
   £950.
5. What is MUSTARD?
   MUSTARD was the British Aerospace design for a British Space Shuttle.

And finally, the two winners of the collections of eight *Star Trek* books are Raymond Boyes, of Glasgow, and Shane Ruston, Bramley, Leeds.

There were lots of entries for this competition, and we were delighted, since we wondered if we'd set too hard questions for you all. As you may recall the questions were:

1. who first talked about 'The Great Bird of The Galaxy'?
2. what exactly did the person say?
3. to whom did the person say it?
4. which episode?

It was of course, Sulu (George Takei) who said 'May the Great Bird of the Galaxy bless your planet' to Yeoman Rand (Grace Lee Witney) in the episode *The Man Trap*.



Boeing's Space Greenhouse.

Asimov's 300th

He is one of the world's most prolific writers – if you built a pile of his books it would probably reach to the moon, which would be apt, because 'he' is Dr Isaac Asimov, 65, who recently celebrated the publication of his 300th book.

Mr Asimov, with about two dozen different publishers, is America's most prolific writer, and also its most eclectic. Besides his science fiction, he is the author of such varied work as mystery novels, history, collections of saucy limericks, guides to Shakespeare, children's stories, textbooks and encyclopaedias.

He has a way to go to reach John Creasy's world record of 564 books under 14 names, but now he's got the hang of it his pace is quickening. His first 100 titles took almost 20 years, the next 100 were done in nine and a half years, and his latest 100 have been dashed off in less than six years.

Neutrons on line

On Sunday 16 December at 7.15 pm the Spallation Neutron Source (SNS) at SERC's Rutherford Appleton Laboratory in Oxfordshire reached a most significant milestone in its installation and commissioning programme. Protons were accelerated to 550 million electron volts in the synchrotron accelerator, extracted from the synchrotron and taken for the first time to the target station. Here they were focused on to the target where neutrons were produced. Neutron spectrometers were used on six neutron beam lines to measure the spectral properties of the neutron pulses and to confirm design characteristics of the target assembly and of the spectrometers. The first neutron diffraction patterns from test samples were also obtained on four of the instruments, even though the proton beam was maintained on the target for only a short time at low intensity in order to minimise activation of components. One unique scientific measurement has already been made.

DATA BANK

Convention Data
by Chris Chivers

1985

March 22-24 DENTON CONVENTION. Media. Birmingham. Guests – Richard O'Brien and Jonathan Adams. Write: 16 Tonbridge Road, West Molesey, Surrey KT8 OEL.

March 23-24 RISING SUNS. Manchester. Write Eric Letherman, 196 Woodlands Road, Cheetham Hill, Manchester M8 7QH.

March 30 STARGATE II. Star Trek. London. Write: Kay Stagg, 33 Barrack Road, Guildford, Surrey, GU2 6RU.

March 30-31 IPMS Modelling competition/exhibition. Canons Leisure Centre, Mitcham, Surrey. Tel: Rod Janes 0322 29656, Les Cooper 01 672 9291 (evenings).

April 5-6 YORCON 3. SF. Leeds. Guests – Gregory Benford, Linda Pickersgill. Write: Mike Ford, 45 Harold Mount, Leeds LS6 1PW or Mary Burns, 23 Kensington Court, Hempstead, New York, NY, USA 11550.

May 3-6 SOL 3 85. Trek. Liverpool. Guest: Mark Leonard. Write 39 Dersingham Avenue, Manor Park, London E12 5QF.

May 25-27 LAZLAR LYRICON. Hitchhikers Guide. Birmingham. Write: Robert Cogger, ZZ9 Plural Z Alpha, 10 Bourne Parade, Bourne Road, Bexley, Kent, DA5 1LQ.

Jul 12-14 TRIPLE S CON. Space and SF. Cardiff. Write: Iain Thomas, 162 Kingsheath Avenue, Rutherglen, Glasgow.

July 13-14 YORKSHIRE SCALE MODELLING WEEKEND. Ripon. Write: R. Thorn, 22 Chatsworth Place, Harrogate, West Yorkshire.

July 19-22 ALBACON '85. SF. Glasgow. Guests: Harlan Ellison, Anne McCaffrey. Write: 20 Hillingdon Gdns, Cardonald, Glagow, G52 2TP.

July 26-28 BECCON '85. SF. Guests: Richard Cowper. Write: 191 The Heights, Northolt, Middx.

Aug 3-4 LEISURE LIVE 2. Dr Who. Swindon. Write: Tony Cherrington, 2 Domestic Quarters, Bryanston School, Blandford, Dorset DT11 0PX (Do not phone).

Aug 15-18 SWECON '85. SF. Sweden. Guests: Chris Priest, Lise Tuttle. Write: A. Engholm, Maskinistgatan 9 8B, S-117 47 Stockholm, Sweden.

Aug 23-26 ENTERPRISE I. Star Trek. Liverpool. Guests: James Doohan, John Shackley. Write: Sharon Rowe, 24 Haywards Close, Clevedon, Avon.

Sept 13-15 CAMCON (UNICON 6). SF. Cambridge. Write: N. Taylor, c/o Perspective Design Ltd. 9 Pembroke St, Cambridge, CB2 3QY.

Sept 20-22 DELTACON '85. Star Trek. Baton Rouge, USA. Guests: DeForest Kelley, Walter Koenig, Walter Irwin. Write: Deltacon, 12529 Cate Avenue, Baton Rouge, Louisiana 70815, USA.

Oct 11-13 MIDCON '85. Star Trek. Leicester. Guest: DeForest Kelley. Write: Terry Elson, 8 Ennerdale Close, Oadby, Leicester, LE2 4TN.

1986

May 2-5 UFP CON '86. Star Trek. Birmingham. Guest: David Gerrold. Write: Kim Knight, 30 Woodcote House, Queen St. Hitchin, Herts.

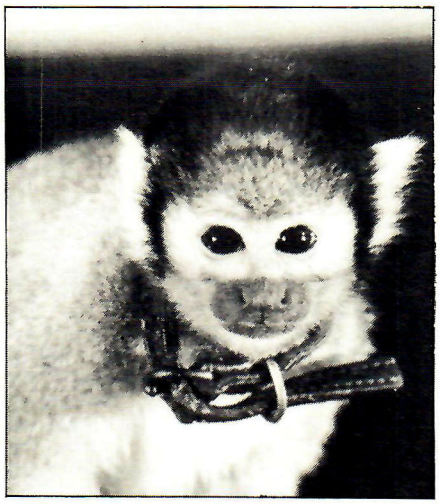
(Readers should always enclose an SAE or IRC when contacting con organisers for details, please).

Space Voyager is hoping to compile and maintain a record of all SF cons round the world, for the benefit of all our readers. We may not publish details of every one, simply because there isn't space, but readers with travel plans will be able to find out about any cons and make arrangements to attend while abroad.

Readers – and especially con organisers from out of Britain – can get into the diary by sending details to Chris Chivers at the new editorial address.

One of the first

One of the first of this world's inhabitants to journey into space, Squirrel Monkey Miss Baker, died recently in America, of respiratory complications following acute kidney failure. She had made her flight in the 1950s, and was judged to have arrived back safely when she bit her handler upon release from the capsule.



Halley Hot Line

British Aerospace, the Halley's Comet Society, and British Telecom, have started a Halley's Comet nationwide Hotline service.

By dialling the following numbers: London 01-790 3400, Birmingham 021-355 6144, Glasgow 041-552 6300, Liverpool 051-236 8474, Bristol 0272 279494, Cardiff 0222 399855, Belfast 0232 230505, Manchester 061-246 8061, Leeds 0532 8013 callers will receive the latest information about the world's most famous comet plus background information and interesting anecdotes about previous appearances, and that famous Englishman, Edmond Halley, whose name it bears.

This special service will be available 24 hours a day for the next 17 months and will be updated every week.

Another Comet probe

A joint project by Germany and the USA is under way to design, build and launch a space probe to examine the nucleus of comet Kopff in the 1990s. The intention is to bring the probe within 30 km of the comet's nucleus, in order to maximise the data that is gathered.

Getting crowded

The latest survey by NASA's Goddard Space Centre shows that there were 1,462 spacecraft in space on September 30, 1984. Space debris, in the form of rocket stages, payload shrouds and suchlike accounted for 3,942 objects, whilst decayed spacecraft numbered 9,944.

New Maritime Terminal

The Maritime Rescue Co-ordination Centre at Falmouth, in the United Kingdom, has installed its own 'ship' earth station for direct access to the INMARSAT satellite communications system.

The new terminal will give Falmouth direct contact by telephone and telex to other overseas rescue co-ordination centres, and ships, fitted with similar terminals. This will be advantageous when assisting with an emergency occurring in a region which is the responsibility of another centre, particularly if that centre is located where the existing communications infrastructure is undeveloped. At times when instantaneous, high-quality communications are vital, it will also enable Falmouth to bypass or minimise possible congestion and switching delays in the regular international communications networks.

Two other rescue co-ordination centres – in Argentina and Bulgaria – now have operating ship terminals and many more are expected to acquire them in the near future.

The Falmouth station already has a direct connection to the Goonhilly, Cornwall, coast earth station, operated by British Telecom International, so that it automatically receives all distress communications transmitted to the U.K. via the INMARSAT system.

New INMARSATS

INMARSAT Council has started negotiations towards the purchase, or lease, of spacecraft for its second-generation satellite system.

The negotiations will go ahead with the two international consortia which have submitted bids to provide INMARSAT's second-generation satellites. One of these is headed by British Aerospace Dynamics Group (UK) with Hughes Aircraft Company (US) and Satcom International (France), and the other is headed by Marconi Space Systems Limited (UK), with Ford Aerospace and Communications Corp (US) and Aerospatiale (France).

If it is decided to purchase the spacecraft, INMARSAT will be placing an initial order for three or four satellites, plus options for additional satellites up to a maximum of nine.

Salvage honour

The five American astronauts who pulled off an historic rescue mission – and saved Lloyd's £34 million – have received one of the City of London's top honours.

The prestigious Lloyd's silver medal, given

DATA BANK

only five times since the last war, was presented to the team by President Reagan.

Lloyd's who financed the £8.3 million operation, rang the famous Lutine Bell to announce the news.

The underwriters stand to recoup £42 million when the Palapa and Westar 6 have been repaired and sold.

Soviet/German movie

For the first time a film production company from the Federal Republic of Germany will join in a co-production with the Soviet Sovinfilm company to shoot a science fiction movie. The contracts were signed at the Munich offices of Hallelujah Film on the third of April, 1984.

The German director and script-writer Peter Fleischmann will film the novel Trudno Byt Bogom (Hard To Be A God) by the brothers Arkadi and Boris Strugatzki. Preproduction is already going on, the actual shooting – at different places in the Soviet Union, at the Dovshenko-studios in Kiew, and at the Munich Bavaria Studios – will be from June to October 1985, for release in March 1986.

The Eclipse of the Moon

On the evening of May 4 there will be an eclipse of the Moon. This happens when the Moon passes into the shadow cast by the Earth: its supply of direct sunlight is cut off, and the Moon turns a dim, often coppery colour until it passes out of the shadow again.

The forthcoming eclipse is visible from most of Europe, including the British Isles. It beings at 18 h 17 m GMT, totality begins at 19 h 22 m; totality ends 20 h 30 m, and the whole eclipse ends at 21 h 35 m. From Britain the Moon will rise partially or totally eclipsed (depending upon the exact position of the observer) and so the phenomenon will not be seen at its best. However, it is well worth watching. The colours of the eclipsed Moon are sometimes beautiful, though we can never tell whether the eclipse will be 'dark' or 'bright'; on some occasions the Moon has been known to disappear completely at mid-totality, while on others it has remained bright. Everything depends upon the state of the Earth's air at the time, because, of course, all the solar rays reaching the eclipsed Moon have to be bent or refracted on to the Moon's surface after passing through the atmosphere of the Earth.

Binoculars are very suitable for viewing the eclipse, so are low-power, wide-field telescopes, but even with the naked eye the spectacle is fascinating. Let us hope for clear skies!

Time Tot

Dr Who began a new adventure recently . . . as the father of a Christmas Day baby.

American actress Sandra Dickinson, whose husband, Peter Davidson, played the TV time traveller until early this year, gave birth to a 7lb 7oz daughter four minutes after midnight on December 25. She is their first child.

Sandra was Trillian in the BBC TV version of *Hitchhikers Guide to the Galaxy* and both were interviewed in *Space Voyager* 12.

Candle power

You can hold candle to it . . . once they have struggled to the top of an extinct volcano in Hawaii with what is going to be the world's biggest optical telescope which will be able to pick up the light of a candle from a quarter of a million miles away.

In the year of the telescope, when we are all going to be bent skywards in observance of Halley's Comet, a foundation started by a former oil wildcatter has given the biggest-ever private science grant, £40 million, to the Californian Institute of Technology and the University of California to construct the biggest spy-glass under the sun.

It will have a 14-ton mirror measuring ten metres in diameter – the largest at present are a six metre instrument in Russia that is apparently broken, and the five metre one currently operated by CalTech – and will look back to the infancy of the universe and detect light from 12,000 million years away.

Astronomers have been planning the telescope for ten years and now the William Keck Foundation has come up with most of the £70 million it will cost to build it on a 14,000ft ridge of the Mauna Kea Volcano, Keck, who died in 1964, used many scientific innovations in establishing an international oil empire.

The scope's 394 in diameter mirror will actually be a mosaic of 36 separate hexagonal mirrors, each controlled by a computer that can make 100 adjustments a second and fine tune to a thousandth of the thickness of a human hair.

Work on the new observatory will start a year from now and it will be ready to operate in 1993.

Books in space

BAe's Space and Communications-built ECS-2 satellite is entering the hush-hush world of the library service.

The British Library Lending Division at Boston Spa, West Yorkshire, is to use ECS-2 to transmit information around Western Europe.

The library is the biggest in the world devoted to supplying periodicals, books and documents.

The scheme, to send facsimiles of scientific and technical papers to major establishments such as industrial libraries and universities, should be under way in 1986.

The library's head of forward planning, Mr David Russon, said they post about $2\frac{1}{2}$ million pages of photocopied material around Europe every year.

'That's not getting any cheaper and it can take five or six days, for instance, to get something from here to Italy.

'We can obviously improve on that quite considerably by using the satellite.'

Ultimately the service could extent to people being able to sit at a computer keyboard and plug in to electronic archives on a network throughout Western Europe, said Mr Russon.

To set up the 'lending by satellite link the British Library is co-operating with the Department of Trade and Industry and British Telecom.

Teddy Bears?

Space Voyager is much bemused to have been made a member of the International Teddy Bear Club. While we wouldn't dispute that we are all lovely and cuddly we're not quite sure what we've done to deserve this honour, or why, for that matter, the club singled us out.

Details, should anyone want them, from PO box 75, London EC1N 2HU.

Astrodunnit?

Over £1,000,000 worth of money prizes are being offered in a major SF 'whodunnit?' to be screened in several countries in the autumn.

The two-hour film, called *Murder in Space*, is set in an orbiting space laboratory, and will be screened without an ending, to allow viewers to send in their ideas for who the killer was. The solution is currently being stored in a bank vault and will only be made into the sequel when the first instalment has been screened across the globe and the 'whodunnit?' competition has been closed. The author even worked under a pseudonym for fear of threats or kidnapping over the prize-money.

The film, which is estimated to cost about £3,000,000, is being made as a co-production by Central TV's film branch, Zenith, and a production company in Canada, where filming began in January.

ESA NEWS

EURECA Go-ahead

After three-years of study the participating States in the EURECA programme have now given ESA the green light to proceed with the development of Europe's first retrievable carrier, EURECA.

EURECA is a logical follow-on to ESA's Spacelab programme, and also a first step in the direction of a future European long-term programme of space transportation systems, providing experience in the development of unmanned, automated platforms.

EURECA will be launched from the Space Shuttle in early 1988. After deployment by the Orbiter, the platform's own propulsion system will take in into its operational orbit with an inclination of 28.5° some 500 kilometres from Earth.

ESA NEWS

Once it has reached this orbit, its large solar arrays will be deployed and its thermal/cooling and data systems switched on and tested. Finally, the payload will be switched on and operated by remote control from the ESA ground station under the responsibility of the European Space Operations Centre (ESOC). EURECA will operate as a free-flyer for six months. On completion of its mission, the platform will return under its own power to meet the Shuttle in its orbit, 296 kilometres from Earth. The Orbiter's remote manipulator arm will retrieve the platform and place it in the cargo bay, ready for its return to Earth. It will then be transported from the United States back to its home base, Europe, for refurbishment prior to its next mission.

Satellites launched

At 01h 14 mins 15 seconds (GMT) on November 10, 1984, Arianespace successfully launched Ariane V11 which placed Spacnet 2, for the commercial firm GTE Spacenet, and the second European Space Agency Maritime Communications satellite, MARECS B-2 into geostationary transfer orbit, with a perigee at 199.9 km and an apogee at 36 022 km.

22 minutes after launch, the European Space Operation Centre ESCO acquired the first signals from MARECS B-2 via the Malindi (Kenya) tracking station and began to carry out the series of manoeuvres required to place the spacecraft in geostationary orbit. After spinning up the spacecraft to 60 rpm, a number of checks were carried out which showed that the satellite's performance was highly satisfactory. The MARECS B-2 apogee boost motor was successfully fired, as planned, at 03 hrs 24 mins 33 secs GMT on November 11, injecting MARECS B-2 into a near circular orbit at 135.5°E (perigee 35.600 km, apogee 35.900 km, inclination 3.190°E).

A few hours later, the satellite's spin rate was reduced to 10 rpm, the solar arrays were deployed and the spacecraft turned over to ensure that the latter were correctly pointed towards the sun.

Ariane V11 was the second flight of the more powerful version of the European launcher, Ariane 3. As was the case for the Ariane 1 development programme, the execution of the Ariane 3 development programme was entrusted to the French national space agency, CNES, with ESA in charge of monitoring. Ariane 3 is 49 m high and weighs about 237 tonnes at lift-off. It has three stages, the first provided with two strap-on boosters that are ignited just after lift-off. Ariane 3 can place a payload of up to 2580 kg into geostationary transfer orbit.

NASA NEWS

Looking for planets

NASA and the University of Arizona have launched a joint project to study, plan and, if approved by Congress, develop an orbiting Astrometric Telescope Facility to be mounted on the agency's planned Space Station sometime in the mid 1990s.

'Astrometric telescopes are used to measure, with extraordinary precision, the positions of stars and other celestial objects against the sky,' said Eugene H Levy, Director of the University's Lunar and Planetary Laboratory and head of its Planetary Sciences Department.

The gravitational pull of planets orbiting around a star cause the star to wobble back and forth as seen against the sky. By measuring this wobble, an astrometric telescope can determine the presence of planets and even determine the properties of such a planetary system. The wobble-measuring technique is commonly used by ground-based telescopes to measure the properties of double stars in orbit around one another. However, to measure the disturbance in a star's motion caused by objects as small as planets, and to study the systems in detail, more precise measurements are required than can be achieved from telescopes on the ground.

Joint mission plans

It is almost ten years since Tom Stafford and Alexei Leonov exchanged their famous handshake in orbit. Since the days of Apollo-Soyuz, the political climate between East and West has deteriorated and any further joint flights looked a remote possibility. But now the situation seems set to change again.

NASA is considering a joint America-Soviet mission involving a Space Shuttle and Salyut space station. It is not possible for a Shuttle to dock with Salyut. Instead, the Shuttle would fly alongside the space station and astronauts could fly over using Manned Manoeuvring Units.

The need for a mutual rescue capability was demonstrated in 1983 when Salyut 7 suffered a fuel leak. At the time it was widely reported that the Americans were considering a Shuttle fight to rescue the 'stranded' Russians. It now seems that such reports were greatly exaggerated and the cosmonauts were never in any real danger. In any event, the Salyut crew eventually got back safely on their own.

If the planned mission goes ahead, many people hope it will lead to long term co-operation in space. There is a great deal to be gained by both sides if this comes about. The Americans do not have the heavy lift capability of Soviet launchers. The Russians lack the flexibility of the Shuttle.

One possibility is a joint US-Soviet programme of lunar exploration. A more ambitious aim is a manned flight to Mars.

British NASA

Britain is to take a small step into space in a £7 million joint programme with Europe and America.

Work on a permanent space laboratory which will plug into the American space station was approved in Rome in January with Britain footing the bill for the first two years.

A 'mini NASA' is to be set up at Farnborough to co-ordinate Britain's space projects and work with the Americans.

SOVIET NEWS

Comet operations

The probes' television eyes will be able to discern the cometary nucleus. Up to now we do not know whether this nucleus is a single snow-dust ball or whether it consists of individual clouds. Instruments will study the chemical composition of comets' matter, characteristics of their plasma tails, their magnetic fields, etc.

The speed of the mutual rendezvous of the probes and the comet will be 80 kms. Of the overall multi-ton take-off mass of Veha-1 only 253 kilograms will be brought to the comet. This is the weight of the vehicle, while the weight of the instruments aboard it is 85 kilograms.

Scientific instrumentation on the Venusian descent module weigh 117 kilograms, while the overall weight of the balloon sonde is 115 kilograms.

The West European Giotto vehicle, which

will be blasted off from the Kouro launching ground in July 1985, will deliver to the comet an instrument payload of about 50 kilograms, while the Japanese probes, which are to be launched in August 1985 will weigh 10 kilograms each. If everything goes smoothly, Vehas will approach the cometary nucleus to a distance of 10,000 kilometres.

The will be able to correct the trajectories of Giotto and the Japanese probes which will perhaps come still closer to the nucleus.

Space Stamp

A new postage stamp, issued by the Soviet Ministry of Communications, is devoted to the Venera – Halley's Comet International Space Project. It is issued in connection with the launching of the Veha-1 automatic interplanetary station.

The drawing on the postage stamp represents the station in space and the trajectory of its flight to Venus and Halley's comet. The drawing also includes the Intercosmos emblem, a commemorative sign and the names of countries whose scientists and specialists took part in developing a complex of scientific instruments and equipment installed in Veha-1.

Salyut flies on

Moscow, December 19 (TASS) – the research station Salyut-7 has been functioning in near-earth orbit for 32 months. It completed 15,407 turns round the earth by 12:00 Moscow time today.

Tests of onboard systems and units of the station, exposed to space conditions for so long, are continuing in line with a programme. Meteorite control equipment and several other research instruments are functioning. Flight control centre is processing and studying incoming information.

According to results of trajectory measurements, the parameters of the Salyut-7 station's orbit are as follows: maximum distance from the earth's surface is 387 kilometres, minimum distance from the earth's surface is 366 kilometres, period of revolution is 91.8 minutes, inclination is 51.6 degrees. The station's onboard systems are functioning normally.

Volcanoes on Venus

Moscow December 14 (TASS) – Soviet automatic space probes have discovered hot spots on Venusian surface which might be active volcanoes, according to Soviet researchers.

The Soviet automatic stations Venera-15 and Venera-16 have been investigating the planet from orbit for 18 months. Mission controllers summed up preliminary results of their operation during a meeting at the station which receives radio signals from Venus.

'In addition to images of the surface of the earlier uninvestigated polar region, we have compiled a thermal map of the practically entire norther hemisphere of Venus,' said Corresponding Member of The Soviet Academy of Sciences Alexei Bogomolov. 'It shows vast areas with temperatures, registered by a radiometer, lower than the average on the planet (about 500 deg C). These areas are covered in lava. What is most interesting is that several hot spots with a temperature of about 700 deg C have been found. It is quite possible that these are active volcanoes'.

The meeting's participants maintained that the Venusian volcanoes should be different from their earth counterparts which have fierce eruptions. It is more likely that their eruptions amount to a slow flow of lava.

The pictures transmitted by the Venera-15 and Venera-16 probes show many dome-shaped formations which look like volcanoes. It is still to be found if these are ancient volcanoes, of which there are many on earth, or young ones. The researchers are receiving more and more images of Venusian surface showing geological structures reminiscent of those on earth.

On earth, they are all covered either with water, or with sedimentary rock, while on Venus, which is a kind of geological reserve, everything can be investigated without hindrance.

● See *Space Voyager* 12, for Patrick Moore's article 'Volcanoes of Venus'.

All-women crews

The Soviet Union is making plans for an all-women crew to visit Salyut in the near future. Ten women are now reported to be training for spaceflight, but details of the female crew have yet to emerge. It seems likely that Svetlana Savitskaya will command the mission with two of the new recruits completing the three woman team.

By the end of 1984 a total of six women, two Russians and four Americans, had flown in space. Svetlana Savitskaya and Sally Ride have each served on two missions. Valentina Tereshkova, Judith Resnik, Kathryn Sullivan and Anna Fisher have each flown once.

Cosmonaut future

Speaking of the prospects for space exploration, Cosmonaut Vladimir Shatalov, who made three space flights, said recently: 'The cosmos was, is and will be a place for work in the interest of science and national economy. Another matter is that the range of professions of the cosmonauts will expand in the future.

'I think that on the threshold of a new millenium, or even a bit earlier, research and production complexes will be working in orbit permanently and reliably. They will be designed for long-term use. A substantial part of such a complex will consist of docked blocks and modules. Research laboratories – astrophysical, biological, medical – will evidently be replacing one another. But geological, ecological, weather and farming services will surely work in the orbit the year round, for data supplied by them are needed on earth permanently.

'Continuous-action space manufactories turning out materials with programmed properties (those which cannot be produced on earth) will also appear.

'Apart from that', Mr Shatalov said, 'orbital complexes will also be used as platforms for interplanetary flights, notably as fuelling and maintenance centres.

'These also can become, although now the idea seems to have been taken from an SF novel, a base for assembling huge mirrors in orbit to light the night-covered side of the planet, if needed, and a base for building electric power plants in the orbit.

'Problems of taking cosmonauts into space and back with only a minimum of discomfort will be solved. People will build and test rocket aircraft, and will make interplanetary journeys'.

Venus and Halley probe

On December 15 the Veha-1 probe was blasted off from the USSR's Baikonur Cosmodrome. This is the first of two spacecraft designed for exploration of the planet Venus and Halley's Comet. The launching consisted of two stages. The proton booster preliminary put the probe into an intermediate near-earth orbit and then Veha-1 headed for Venus. The probe will reach the vicinity of Venus in June 1985. There a descent module will be jettisoned and will land on the Venusian surface, while the probe will continue its flight to Halley's Comet. The encounter with the comet will take place in March 1986. On December 21 the Veha-2 Probe was launched. It will follow a similar route.

Nine countries – six socialist and three West European – are taking part in the Veha project. These are: Bulgaria, Hungary, the German Democratic Republiç, Poland, the Soviet Union, Czechoslovakia, France, Austria and West Germany.

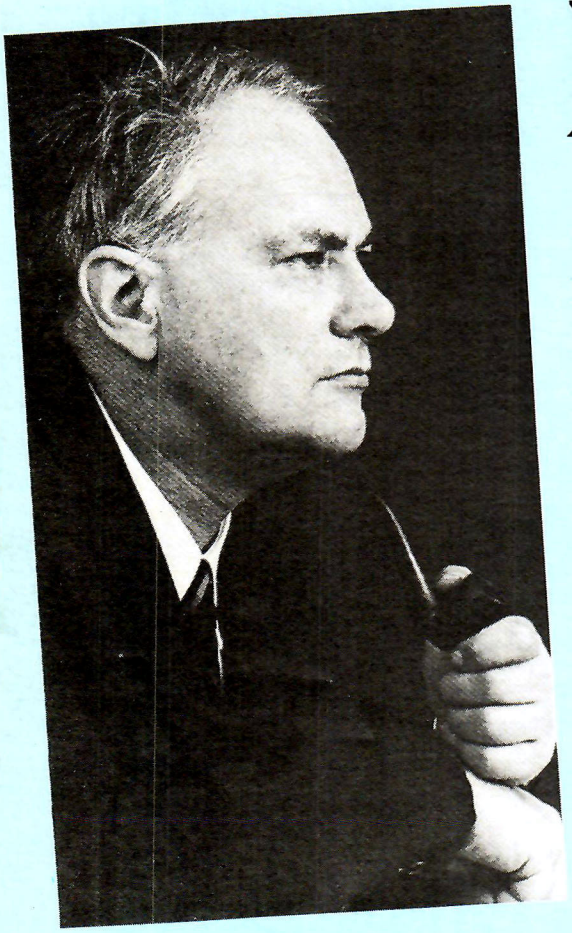
Commenting on the launching of Veha-1, Anatoly Alexandrov, President of The USSR Academy of Sciences, noted that although the cometary part of the project can be sensational and can dwarf the Venusian part, the setting of priorities would be out of place: both programmes were very important for functional science.

In the course of the interplanetary journey Vehas are to solve three groups of problems. The first group, which is new in principle, is atmospheric studies by balloon sondes. Two balloons delivered by the probes will carry instrumentation and for about two days each of them will drift in the Venusian atmosphere and transmit to the Earth data about Venus's atmosphere – the temperature, the pressure, the chemical composition, the speed of wind, etc.

Information will be received by two networks of radio telescopes: the Soviet network and the international one. The latter includes telescopes located in Western Europe, North and South America, Australia and Africa. Exchange and some processing of data is envisaged by an international team of researchers from the Soviet Union, the United States and France. This part of the work is to be completed by the beginning of 1987.

Soviet Venera probes have already carried out direct measurements of the characteristics of Venusian soil and its elemental composition. The same operations will be performed by The Descent Modules of Veha probes. Measurements will cover new sections of the planet.

FROM AN ASTRONOMER'S DESK



PATRICK MOORE, OUR NEW CONSULTANT EDITOR, TAKES THE HELM WITH HIS FIRST REGULAR COLUMN.

The story of astronomy is full of characters, not all of them entirely pleasant. I do not really think I would have liked the great Dane, Tycho Brahe, who had part of his nose sliced off in a duel during his student days, and subsequently set up an observatory which included a prison – designed specially for his tenants who were slow in paying their rents. There was also a French astronomer whose two passions were cats (of which he kept forty) and spiders (which he ate). But there are endearing characters too; and one of them is very much alive today – I know him very well, and I had a letter from him just before Christmas. His name is Clyde Tombaugh, and he is the only living man to have discovered a new planet.

Clyde today is almost eighty, but he achieved fame when he was very young indeed. He grew up on a Kansas farm, and took an early interest in astronomy. He built a telescope, looked at the planet Mars, and sent some of his drawings to the Director of the Lowell Observatory at Flagstaff, Vesto Melvin Slipher. Slipher was impressed, and thought that young Tombaugh might be useful.

There was a hunt being prepared – for a planet moving beyond the orbit of Neptune, which was then the outermost known member of the Solar System. The Lowell astronomers believed it to be there, and they had some idea of where it might be, because a possible position for it had been worked out by Percival Lowell – founder of the Observatory. But Lowell had died in 1916; it was now 1929.

The Observatory had acquired a new telescope (a 13-inch refractor) specifically for the hunt. There was nobody to take charge of it. What about Tombaugh?

Clyde Tombaugh came to Flagstaff. Before long he was firmly installed there, and taking photographs nightly in his attempts to locate the new world. He had his own methods; they involved photographing the same star-field over a few nights' interval, and then checking to see whether any of the 'stars' had moved. This meant using a device called a blink-microscope or blink-comparator. Each star is examined in turn, on one plate after the other; 'flicking' to and fro, and the persistence of vision will identify any object which has shifted.

'I've found your planet!'

It is tiring work, but by early 1930 there was great excitement. A tiny speck in the constellation of Gemini moved by just the right amount. When he was satisfied, Clyde knocked on Slipher's door. 'I believe I've found your planet!'

He had indeed; today we call it Pluto, and it has proved to be a very peculiar little world. At present it is actually closer-in than Neptune, and it is smaller than our Moon. But the fact that it was tracked down was a tribute both to Slipher's persistence and Clyde Tombaugh's skill. Actually the hunt went on for several years afterwards, and in all Clyde examined 90,000,000 star images, but no more planets came to light. I firmly believe that one exists; but it is bound to be very faint – too faint to be recorded with the 13-inch refractor.

I first heard of the discovery of Pluto during a science class at my prep. school. I was then six years old. Had anyone told me then that one day I would meet Clyde Tombaugh I would have been incredulous. But in the early 1950s, when I was Moon-mapping in Arizona, I did so; and subsequently he paid me the great honour of asking me to collaborate with him in his book about Pluto. I didn't need to be asked twice. Working with Clyde was a privilege which cannot be forgotten.

Tombaugh's planet

In 1980 came the Pluto Conference at Las Cruces, where Clyde is now Professor Emeritus. It was exactly fifty years since the discovery; Clyde was paid the greatest honour that the University could bestow, and a minor planet (No. 1604) was named in his honour. I remember his comment that at least he now had a piece of real estate which nobody could touch.

From being a raw student, Clyde has become one of America's most senior and most popular astronomers. (I cannot resist relating one story about him. After he had discovered Pluto, he went to University to take a degree. It is hardly surprising that he was banned from the 'elementary astronomy' class!) Officially he retired some years ago, but this has made no difference to him. He still goes to his office in Las Cruces University every day; he still helps and encourages students, solves problems, and is always on hand – and his study is as wildly untidy as ever. How he ever finds anything is something which I have never understood!

At his home there are two telescopes. One was made decades ago, and is mounted outdoors; the cap covering the flat mirror still bears the word 'coffee'. The other is a 16-inch reflector. At a glance it looks rudimentary. In fact it is a magnificent precision instrument, constructed as few people could construct it. And it is in constant use; as an observer Clyde is as keen and as skilful as he was half a century ago.

The story of Clyde Tombaugh may not be unique, but it is at least unusual. He will always be remembered for his discovery of Pluto, but he has done much since then, and his career is by no means over. I have not seen him since 1982, though we have corresponded often enough; but I am going back to the States in January 1986, when the Voyager 2 probe will by-pass Uranus, and I have no doubt that Clyde Tombaugh will still be in the forefront of affairs. Long may he prosper!

SPACE CAREERS

TODAYS YOUNGSTERS CAN AT LAST PLAN THEIR STUDIES TO ENHANCE THEIR CHANCES OF A JOB IN SPACE. IN THIS SECOND PART OF HIS SERIES, ANDY NIMMO OFFERS SOME CAREERS GUIDANCE.

Assuming there will be opportunities for work in space, how should you go about preparing to take advantage of them?

In the last issue, we had a look at who chooses projects, touched briefly on motives for choices, considered the joint US-European Space Operations Centre (SOC), the O'Neill plan for Solar Power Satellites (SPSs), and the possibility of a space hotel in Low Earth Orbit (LEO). The idea of a mini-SPS in geosynchronous orbit (Geo), which could power extensions to space industrial facilities in LEO, was also mentioned, as was the possibility of using this to power laser-powered launch facilities at airports on Earth, and how this could greatly reduce costs of space launches, especially where waverider shuttlecraft capable of landing at any airport, were used.

Of the above, so far only SOC is approved. In the next and final part of this mini-series, I'll go into how you can help encourage approval of the right projects. First though, let's have a look at the situation for getting into space today.

Spacelab Choice

Though the French had their own private deal with the Russians, as far as Europeans in general are concerned, Spacelab presented the first opportunity to go to space. It was launched on November 28 1983, but advertising for astronaut candidates for it started much earlier.

'Scientist or Engineer for Spacelab Flight' demanded the advert headline. The first one I saw appeared in the June 16, 1977 issue of *New Scientist*. 2,000 people answered this and similar ads all over Europe. A year earlier, NASA had issued a press release. In this case, describing qualifications required for Shuttle Pilots and Mission Specialists.

'Pilot applicants must have a bachelor's degree from an accredited institution in engineering, physical science or mathematics or have completed all requirements for a degree by December 31, 1977. An advanced degree or equivalent experience is desired. They must have at least 1,000 hours first pilot time, with 2,000 or more desirable. High performance jet aircraft and flight test experience is highly desirable. They must pass a NASA Class 1 space flight physical. Height between 64 and 76 inches is desired.' it said.

'Applicants for mission specialist candidate positions are not required to be pilots. Educational qualifications are the same as for pilot applicants except that biological science degrees are included. Mission specialist applicants must be able to pass a NASA Class 2 space flight physical. Height between 60 and 76 inches is desired.'

After a brief remark about pay rates, it continued:- 'Civilian applicants may obtain a packet of application material from JSC. Requests should be mailed to either Astronaut (Mission Specialist) Candidate Program or Astronaut (Pilot) Candidate Program, Code AHX, NASA Johnson Space Center, Houston, Texas, 77058.'

By January 1978, NASA's Administrator Dr Robert Frosch was able to release photos of the 35 chosen from 8,079 applications. 'After two years of training and evaluation at the Johnson Space Center,' he said, 'Successful candidates will become astronauts and enter the Shuttle training program leading to selection on a Space Shuttle flight crew. Pilots will operate the Space Shuttle Orbiter, manoeuvring it in Earth orbit and flying it to Earth for a runway landing. Mission specialist astronauts will have overall responsibility for co-ordination, with commander and pilot, of Space Shuttle operations in areas of crew activity planning, consumables useage, and other Space Shuttle activities affecting experiment operations.

They may participate in extravehicular activities (space walks), perform special payload handling or maintenance operations using the Space Shuttle remote manipulator system, and assist in specific experiment operation at the discretion of the experiment sponsor.'

Application forms

Back here in Europe, those who answered ads such as the one in the June '77 *New Scientist*, were sent application forms. These consisted of a couple of questionnaires, a couple of declarations, notes and an information paper.

The positions being advertised in this case were for payload specialists. By May 1978, ESA had whittled the applicants down to four, of whom one, Dr Ulf Merbold, would actually go on the first mission along with one of the six, to which the Americans had whittled down their list. This was Byron Lichtenburg, a vestibular researcher at MIT.

Mr D W Beck of the UK Department of Industry, Research and Technology Requirements and Space Division 5, put it this way, 'The criteria for selection for Spacelab Payload Specialists were laid down by the European Space Agency in conjunction with NASA, and the UK, like other member nations of the ESA, carried out what could be termed a screening process. Roughly, this process selected from completed questionnaires, the most suitable applicants with current practical experience in the scientific fields appropriate to the first Spacelab Payload.' He continued, 'Those selected were interviewed by a scientific panel and subjected to medical and psychological testing to jet pilot standard.'

The 'Information Paper' which accompanied the questionnaires described the Payload Specialist's job as being the operation of experiments in space on behalf of the experimenters, who would be on the ground. Qualifications needed included at least five years experience in a subject related to experiments on the flight, and applicants had to be under 50 at the time of the flight.

On the medical side, it pointed out that wearing glasses would not necessarily bring about exclusion, but wearing contact lenses was out. It also warned of tests in centrifuges, rotating chairs, and pressure chambers.

A key paragraph on psychological requirements read, 'The objective of any psychological test is to ensure that the payload specialist can cope adequately with Spacelab workload and environment. This activity will have to be carried out under a certain degree of stress and in co-operation with other crew members (male or female). General characteristics expected of the candidate include good reasoning capability and memory, good attention span, and a good aptitude for spatial orientation and manual dexterity. The candidate's personality should be characterised by high motivation, good flexibility, gregariousness, empathy for fellow workers, low aggressiveness and sound emotional stability.'

There were also several pages describing the objectives and nature of the experiments being planned for the mission concerned.

Future Requirements

For Spacelab flights, you clearly need to be either a scientist or a jet pilot and you need to be experienced, fit and intelligent, though you

don't require to be a super man or woman. SOC, or a Geo-base or extensions to these would probably require similar qualifications.

Indications resulting from Spacelab experiments show that there may be particular opportunities arising in the following fields:- astronomy, biochemistry, biophysics, chemistry, computer chip manufacture, computer hardware engineering, computer programming, crystallography, electrical engineering, electronics engineering, fibre expertise, fluid physics, geography, laser expertise, lens manufacture, lubrication, magnetic physics, materials science, mechanical engineering, medical research, metal casting, meteorology, optical research, photography, plasma physics, power engineering, psychology, radiation expertise, robotics, solar physics, systems analysis, and tribology.

If you're not sure what any of those subjects are, check in a good science dictionary. You never know, it just might turn out to be the one which suits you perfectly!

At first of course, SOC will be very small.

ASTRONAUT CANDIDATES SELECTED JANUARY, 1978

The General Questionaire

APPLICATION FORM FOR THE POSITION OF PAYLOAD SPECIALIST IN THE ESA/NASA FIRST SPACELAB FLIGHT

PART 1 - General

1. SURNAME..... 2. GIVEN NAMES.....
3. DATE OF BIRTH..... 4. NATIONALITY..... (see Note 1)
5. EDUCATIONAL/PROFESSIONAL QUALIFICATIONS (see Note 2)
6. GIVE BRIEF SYNOPSIS OF CAREER TO DATE (continue on separate sheet if necessary)
7. PRESENT OCCUPATION
8. IN WHICH TECHNICAL FIELD(S) REVELANT TO THIS SPACELAB FLIGHT HAVE YOU ALREADY GAINED EXPERIENCE ? (see Note 3).
9. GIVE SPECIAL INFORMATION TO JUSTIFY YOUR ANSWER TO QUESTION 8
10. GIVE DETAILS OF ANY EXPERIENCE OF FLYING.
11. IF SELECTED BY ESA IN 1977, ARE YOU PREPARED TO INTERRUPT YOUR NORMAL CAREER FROM THE END OF 1977 TO LATE 1980/EARLY 1981? (In this connection you should note that your ESA employment could be terminated at about mid-1978).

plovers Declaration

I believe that this applicant broadly meets the general requirements described in the accompanying literature.

This organisation will be prepared to release the candidate for the necessary periods of time and to support him/her during the period before ESA employment can start. (see Note 4).

The Medical Questionaire

PART 2 - MEDICAL HISTORY

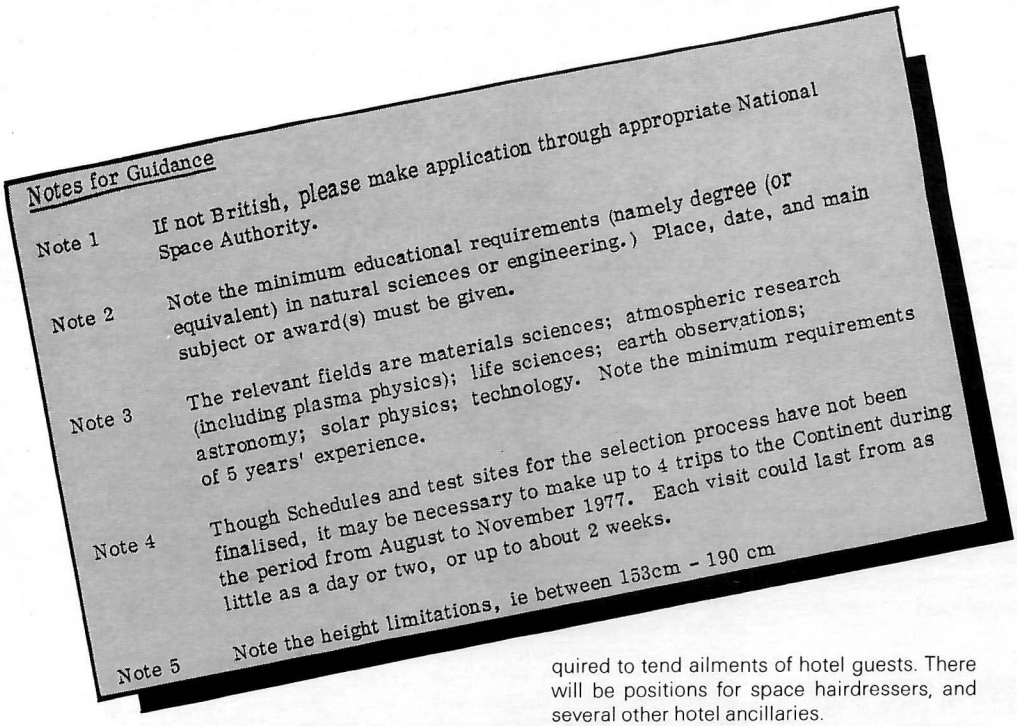
1. SURNAME..... 2. GIVEN NAMES.....
3. HEIGHT (see Note 5)..... 4. WEIGHT.....
5. DATE OF BIRTH.....
6. DO YOU HAVE ANY ABNORMALITY IN YOUR VISION.
7. DO YOU HAVE ANY ABNORMALITY WITH YOUR HEARING.
8. IF THE ANSWER TO 6 or 7 IS YES, GIVE DETAILS.
9. DO YOU HAVE ANY UNDUE SUSCEPTIBILITY TO MOTION SICKNESS ?
10. IF THE ANSWER TO QUESTION 9 IS YES, GIVE DETAILS.
11. HAVE YOU EVER SUFFERED FROM A SERIOUS INJURY, ILLNESS OR HAD AN OPERATION ?
12. IF THE ANSWER TO QUESTION 11 IS YES, GIVE DETAILS AND DATES.
13. HAVE YOU ANY IMPORTANT PHYSICAL DISABILITIES ?
14. IF THE ANSWER TO QUESTION 13 IS YES, GIVE DETAILS.
15. ARE YOU, TO THE BEST OF YOUR KNOWLEDGE, IN GOOD HEALTH ?
16. ARE YOU PREPARED TO PROVIDE FULL PERSONAL AND FAMILY MEDICAL HISTORIES ?
17. ARE YOU PREPARED TO BE THE SUBJECT FOR VARIOUS FUNCTIONAL/PHYSIOLOGICAL EXPERIMENTS DURING THE FLIGHT ?
18. ARE YOU PREPARED TO BE SUBJECTED TO A RIGOROUS SCREENING PROCESS WHICH WILL INCLUDE BOTH DETAILED MEDICAL AND PSYCHOLOGICAL TESTS ?

ARATION BY APPLICANT

apply for consideration for the post of Payload Specialist in the First Spacelab
I have read the explanatory literature.
2. To the best of my knowledge I declare that the answers to the questions in parts 1 and 2 of this application are true and that if selected I will be prepared to devote myself full time to this project until my contract with ESA ends.

derstand that the decision of the selection panels must be accepted as final
o appeal will be allowed.

..... Date.....



Notes for Guidance

Note 1 If not British, please make application through appropriate National Space Authority.

Note 2 Note the minimum educational requirements (namely degree (or equivalent) in natural sciences or engineering.) Place, date, and main subject or award(s) must be given.

Note 3 The relevant fields are materials sciences; atmospheric research (including plasma physics); life sciences; earth observations; astronomy; solar physics; technology. Note the minimum requirements of 5 years' experience.

Note 4 Though Schedules and test sites for the selection process have not been finalised, it may be necessary to make up to 4 trips to the Continent during the period from August to November 1977. Each visit could last from as little as a day or two, or up to about 2 weeks.

Note 5 Note the height limitations, ie between 153cm - 190 cm

There will only be room for about half-a-dozen scientists. Once the manufacture of one-shot cures for diabetes for example, gets underway though, there will be a call for further facilities. Only relatively small amounts of the necessary chemicals will be manufactured. There are large numbers of diabetics. Why should one get the cure and not another? Once that question is asked, the only answer will be to make more of the necessary space-manufactured 'beta' cells. That will mean a larger, more permanent electrophoresis facility in space.

In this particular instance, it won't help get you up to any great extent, as the medicine can be manufactured automatically, but the same or similar arguments will apply to other space industrial items, and space wonder-drugs in particular.

Also, the very fact that there won't be all that much room will cause scientists in the disciplines not initially included to set up their own calls for extensions. Computer scientists in particular, are going to be fighting tooth and nail for room as soon as they realise the enormous potential advances.

Business interest

Once business realises the space potential, stock-markets and economists will get in on the act. Apart from space jobs, the space industry could put millions back to work here on Earth, it could well provide an economic miracle for politicians.

Right now there is a possibility of a Shuttle flight for a journalist or two and NASA is planning a special experimental flight for folks older than usually taken up, but within five years of SOC coming on-stream in any commercial sense, the need for a space hotel will be becoming obvious. This will provide opportunities for many people with very different qualifications.

There will be employment for administrators, barmen, chambermaids, cooks, porters and stewards. A space cabaret circuit may be set up, offering at least temporary space employment to members of the theatrical profession. Nurses will probably be required to tend ailments of hotel guests. There will be positions for space hairdressers, and several other hotel ancillaries.

As I pointed out in part 1, the economics of space industrialisation and tourism will lead to the development of a cheaper Earth-to-orbit transport system. This may take the form of laser-launched Waverider shuttlecraft. Building these will be one of the major Earth-based space industry employers. Their advent, by making everything in space much cheaper, will bring about major expansion in both LEO and Geo. This in turn will bring in the possibility of space-generated power for the laser-launches, making things cheaper still.

Prospectors will inevitably stock up and go off in search of fame and fortune from nearby asteroid resources.

Space safety

Many of these will never be heard of again. Mistakes will be made. Space will be no picnic. There will be lots of do-gooders trying to inflict inhibiting rules and regulations to protect people from their own folly, and possibly make it illegal to go off out to space without vast and expensive precautions or Government control of some kind. This would be folly far worse than the loss of a few lives. It could inhibit space exploitation to the extent of keeping us all Earthbound.

Sensible regulations must be agreed, but they should be to encourage, rather than discourage. Groups will go out, and some of them will be successful. Vast fortunes will be made, particularly in the fields of strategic minerals. Almost all of which are scarce on Earth but abundant on the asteroids. Opportunities will therefore also arise for space miners, and because of the time taken on voyages to and from the asteroids, space settlements will have to be constructed out there, even if the one in LEO doesn't materialise.

As soon as you have a settlement off Earth, whether in LEO, lunar orbit, or out at an asteroid, with some thousands of people in occupation, opportunities right across the spectrum of human activity will present themselves. The settlement will need a bank, post office, butcher and baker (and maybe even a candlestick-maker!)

All of this could come within the next twenty or thirty years, well within the age-reach of most readers. Medical improvements, possibly developed in LEO, could even bring it within reach of anyone of almost any age at present, who lives at least another 15 years. Within that time, life-extension may be very rapid.

Personal Effort

Until the first settlement is built, jobs in space are bound to be limited with thousands after every one.

For scientific work, you'll need a degree. If you haven't got one and are no longer at school or studying, write to: The Universities Central Council on Admissions, at PO Box 28, Cheltenham, Glos., GL50 1HY, and ask for a copy of their booklet, *How To Apply For Admission To A University,* which gives details of most courses available at British universities.

If you haven't enough entrance qualifications, most local authorities run evening classes where you can catch up, and there's also The Open University whose degrees are as good as any other, and entry qualifications are not generally required. The Open University is at PO Box 48, Milton Keynes, MK7 6AB. Apply a year in advance for the course you want and check the cost in advance also.

Getting fit shouldn't be a problem in our health-orientated society, but if in doubt, have a look at the Penguin book, *Physical Fitness.* It gives full details of the Royal Canadian Airforce course, *5BX* for men, and *XBX* for women. A few minutes a day is all you need to get fit.

Mental fitness is another matter. Contrary to what most people think, you can improve your brain-power considerably if you know how to go about it, and it isn't difficult. There are three particular ways which will be helpful to you: you can improve your mathematical ability, to help you think straight, you can learn speed reading, whereby you'll be able to absorb more, and you can improve your memory.

My advice is to start with memory and use it to help you with the other two. Either, *How To Develop A Super-Power Memory* published by the New English Library, or *The Memory Book* published by Wyndham Books, both by Harry Lorayne, will enable you to remember anything, even long numbers, for months, even years ahead, and with perfect accuracy.

For mathematical ability, computer programming is a good way of encouraging your mind to think logically, but *The Trachtenberg Speed System of Basic Mathematics* is also well worth learning. Much used on the Continent, this has been translated by Anne Cutler and Rudolph McShane and put out as a paperback by Pan Books. If you're out in space on an MMU and something goes wrong, an ability to do basic maths quickly without a calculator might save your life. It'll also give you an edge in exams which may get you a position you need, en route to space.

Tony Buzan's book, *Speed Reading,* published by David & Charles, is not only on my recommended reading list, but on The Open University's also.

No matter how good your preparation however, none of these space opportunities will come your way unless somebody makes them happen. How we can ensure that they do is the subject of the final part of this series, *Persuasions,* in the next issue of *Space Voyager.*

FOR YOUR INFORMATION

ROG PEYTON RETURNS WITH MORE ANSWERS AND ADVICE ON BOOKS AND FILMS FOR READERS SEEKING ENLIGHTENMENT.

I have just returned from seeing a preview of the film *Dune*. I can hardly believe it – I feel as if I've been dreaming. Did I really see an intelligent, adult SF movie that makes the viewer work? I read the book nearly twenty years ago and was greatly impressed but never thought someone would make a successful movie from it. But I've just seen it. Tremendous! If you're sick of cuddly little aliens (and ones who turn out to be not so cuddly) and you prefer to think while watching a movie, then *Dune* could be the movie for you. Thoroughly recommended.

But enough! On to your questions!

I have watched the film *Bladerunner* about 9 times and wish to read the book on which it was based – *Do Androids Dream of Electric Sheep* by Philip K Dick but my local bookshop says it is not printed over here any more. Can you Help?

Wattie Cheung,
Oban,
Scotland

I admire your stamina, Wattie – I only managed to sit through about 15 minutes of that movie – I simply hated the soundtrack music. But yes – the book is available over here. First published by Granada in 1972 and reprinted in 1977, it was re-issued under the title Bladerunner *in 1982 to coincide with the film release. Although it went out of print virtually immediately, Granada decided not to reprint it. Then it suddenly reappeared in September 1984 without any announcement from Granada – it doesn't even appear in their complete stock list! Presumably it was reissued by popular demand* after *their July-December stock list was printed. But it is in print and the ISBN is 0-586-03605-9. It is still under the film title* Bladerunner.

I've been told that Patrick Moore wrote a few SF books some years ago. What were they and are they still available?

Mary Newman,
Blackpool

Patrick Moore has written more than a few SF books – all for younger readers though. Nothing for the adult market.

His first four books were Master of the Moon *(1952),* Island of Fear *(1954),* The Frozen Planet *(1954) and* Destination Luna *(1955). Then came the* 'Quest' *series,* Quest of the Spaceways *(1955) and* World of Mists *(1956) and the 'Maurice Gray' series,* Mission to Mars *(1955),* Domes of Mars *(1956),* Voices of Mars *(1957),* Peril on Mars *(1958) and* Raiders of Mars *(1959). Somehow, in the middle of these he found time to write* Wheel in Space *(1956). After the series he returned to one-off novels:* Captives of the Moon *(1960),* Wanderers in Space *(1961),* Crater of Fear *(1962),* Invaders from Space *(1963),* Caverns of the Moon *(1964) and* Planet of Fire *(1969).*

It appears that he then gave up writing fiction for several years as I can find nothing listed anywhere. He then returned to writing fiction with the 'Saunders' series: Spy in Space *and* Planet of Fear *(both 1977),* The Moon Raiders *and* Killer Comet *(both 1978) completing the series with his last book* The Terror Star *(1979).*

Now for the bad news – they're all out of print! 23 books and as far as I can discover, not one in print. I suggest that you start looking around the second-hand shops, Mary. Good hunting!

Some years ago I saw a film on TV starring William Shatner called, I think, *The People*. Can you tell me anything about it and if there is a book?

Kay Brown,
Coventry

You're quite correct, the film was indeed called The People *and it is currently available in this country on video from Iver Film Services. The price should be around the £40 mark. The film is based on the series of stories about The People written by Zenna Henderson. The series started with 'Ararat' in 1952 appearing in* The Magazine of Fantasy & Science Fiction *where all the rest of the series have since appeared. The stories have been collected into two books –* Pilgrimage *(1961) and* The People: No Different Flesh *(1966). Both were published over here in the sixties but have never been reissued. In America, however, the books keep on selling and are still in print from Avon books. You should be able to obtain them from any of the specialist SF shops over here. There is also a further story of The People which appears in Zenna Henderson's collection* Holding Wonder *(1971). Again this is still in print from Avon in America. All wonderful stories and I've never been able to understand why they aren't kept in print over here.*

G1 COMPETITION

A couple of issues ago *Space Voyager* reviewed a new board game called G1.

Reviewer Chris Richmond commented:
'In the beginning there was void. Then eruption – the Big Bang scattered atoms across the universe. Galaxies formed and reformed and the first of these was G1.

'Now five races seek domination of the Galaxy. To do this they must build a battle station from four sections spread across the vast emptiness of space and dock their spaceship with the station.

'The game itself is remarkably simple to learn and contains rules for two levels of play – simple and not-so-simple. The board – for which Greg Houlgate, who designed the game, won a minor graphics award – represents the galaxy, with a 'black hole' at the centre and 10 spiral arms radiating out to the various 'homebases'.'

And he concluded:
'All told, this game – for two to five players – represents very good value for £7.99. Easy to learn and strategically challenging – especially when all five 'teams' are playing. The rules, as we have said, may be used at two levels of difficulty; the simple style dispenses with such complexities as fuel cells and supply cards so even adult life forms can play!'

Now, thanks to makers Hungry Owl Publications, *Space Voyager* readers have the chance to win six sets of G1, by entering this easy competition. All you have to do is answer the three easy questions about our Solar System below and send your answers, with the coupon at the corner of the page to: G1, Space Voyager, ASP, 1 Golden Square, London W1R 3AB.

First six correct entries out of the Editor's hat win copies of the game.

G1 Competition

Which Planet is famous for its Rings .....

Name the 'Red' Planet .....

Which Planet has a big red spot on its surface .....

Rules

1. The competition will close on May 1, 1985 and the first six correct entries out of the editorial hat will win.
2. Each entry must be accompanied by the entrant's name, address and the special coupon cut from this page. Each coupon covers only one entry.
3. Proof of posting will not be accepted as proof of receipt. Whilst every care will be taken, the publishers of *Space Voyager* cannot accept any responsibility for lost entries.
4. The competition is open to all residents of the United Kingdom. The staff of ASP Ltd and their relatives, and *Space Voyager*'s printers, advertisers and contributors, are not eligible for entry.
5. The submission of a competition entry implies acceptance of those rules. The editor's decision is final and no correspondence will be entered into.

G1 CLIP 'PON

NIGHT SKY

DUNCAN LUNAN BEGINS A REGULAR FEATURE PLOTTING WHAT WILL BE WHERE IN THE NIGHT SKY. WE HOPE THE MAPS AND NOTES WILL PROVE USEFUL TO READERS WISHING TO DEVELOP THEIR ASTRONOMY SKILLS.

MARCH

Having been at its greatest elongation (furthest from the Sun) in the morning sky in January, but barely visible in Britain because it was so far south of the celestial equator, *Mercury* now comes to maximum elongation in the evening sky on March 17 and will be well placed for northern hemisphere observers – the best chance all year, in fact. On the 17th Mercury sets nearly two hours after the Sun; it will be brighter, though nearer the Sun, before then. On the 22nd it will be south of Venus and the two planets will be almost in line with the thin crescent Moon.

Venus itself will be bright and unmistakable throughout the month. As it overtakes the Earth in its orbit, perspective makes Venus appear stationary on the 12th, thereafter seeming to draw rapidly towards the Sun from night to night.

Perspective effects are at work for *Mars* too, for its west-to-east motion against the background of the stars has kept its setting time at around 9 pm (just off our maps to the west) since the turn of the year.

Jupiter is in the morning sky, continuing to draw out slowly from behind the Sun, and is passed by the Moon on the 17th.

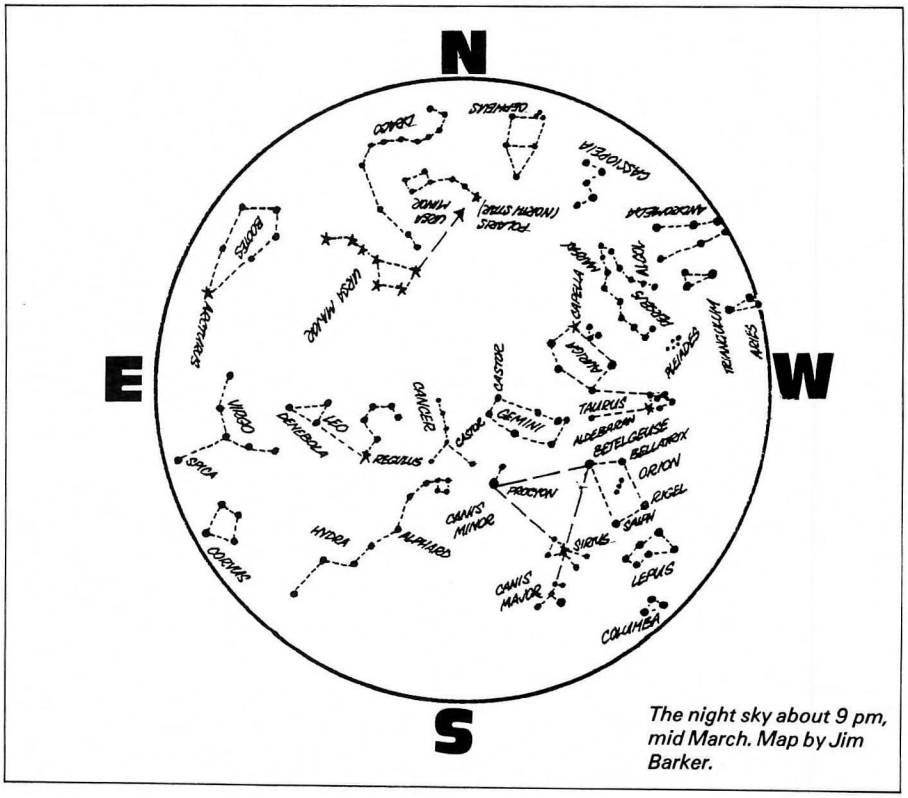
Saturn now rises before midnight, on the eastern side of Libra. The Moon will appear close to it in the south on the 11th.

Uranus is rapidly being overtaken by the Earth, its time of rising advancing during March from 2.30 am to just half-an-hour after midnight, with *Neptune* following an hour behind.

Uranus is a very strange planet, about which we know little. The oddest thing is the tilt of its axis, just over 90 degrees, so that Uranus lies on its side with respect to the other planets – and its rings and moons follow suit. The seasonal pattern is extraordinary, as a result, and the Sun is now overhead at the north pole. A French observatory has confirmed mottling round the polar regions, like Jupiter's and Saturn's, indicating internal heat. The Voyager 2 spacecraft arrives there in 1986, and is already sending pictures. During 1985, these will surpass the best which can theoretically be received from Earth. Voyager has to survive the Uranus encounter if it's to reach Neptune in 1989, so the suspense is mounting.

APRIL

By an interesting coincidence, both *Mercury* and *Venus* come to inferior conjunction, ie pass between the Earth and the Sun, on April 3. As both of their orbits are inclined to the Earth's, actual transits (when they're seen to cross the Sun's face) are rare, and there won't be any transits of Venus this century. The inclination effects are significant this time, because the Sun crossed the celestial equator at the Vernal Equinox only 11 days before. Mercury passes the Sun heading southward, and as a result will be visible only to southern



The night sky about 9 pm, mid March. Map by Jim Barker.

hemisphere observers later in the month.

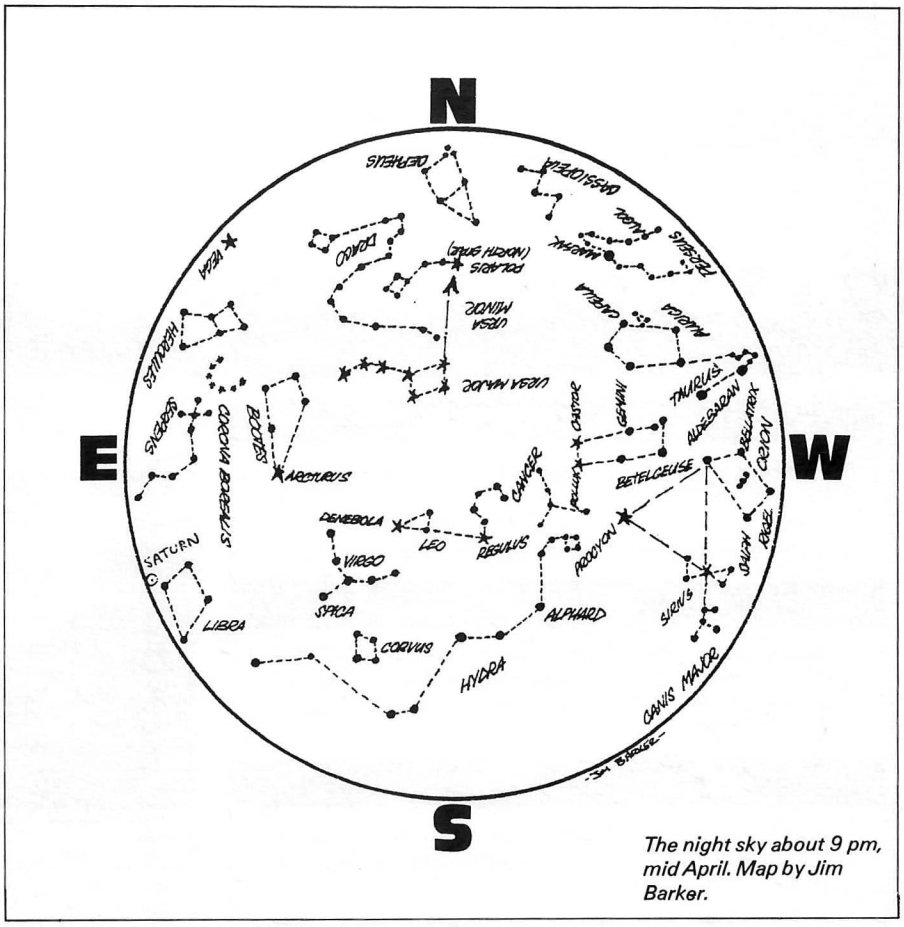
The orbit of Venus is less tilted with respect to the Earth's, but because Venus is nearer to us at inferior conjunction than Mercury is, the effects of perspective are greater. Venus will appear 7.6 degrees north of the Sun in Ecliptic Latitude at its closest, and there's a chance that highly skilled observers may be able to keep it in view. *Amateurs should not risk it* because of the chance of accidentally pointing telescope or binoculars at the Sun, only three fingers' breadths away. There is a safer challenge: it may be possible to see Venus in the morning and evening sky, for several days around inferior conjunction, although it will be only a few degrees above the horizon in either case.

Mars is still setting around 9 pm (GMT), but growing fainter, while the sky at that time grows brighter. The Moon appears near it on the 22nd.

Jupiter is now bright in the morning sky and being overtaken by the Earth, rising at 4 am early in April and at 2 am at the end of the month. The Moon passes it between the 13th and 14th.

After many months in which there have been no planets to mark on 9 pm star maps (drawn for this column by Jim Barker), *Saturn* has finally made it on to the eastern edge, rising with the stars of Libra.

Uranus rises between 11 pm and midnight, and *Neptune* around midnight by the end of the month. *Pluto* is at its closest for the year on the 23rd, but can only be seen with large telescopes, even though its weird orbit has brought it closer to us than Neptune ever comes.



The night sky about 9 pm, mid April. Map by Jim Barker.

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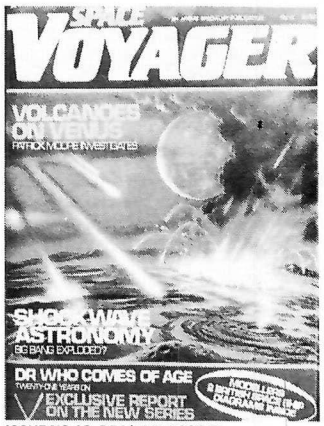

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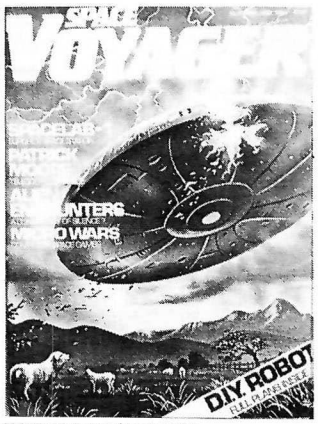
Contents:
THE LIZARDS RETURN – New series of V. PREPARE TO MEET THEY DOOM – David Hardy art feature. VOLCANOES OF VENUS – Patrick Moore tells all. PLUS: Gene Roddenberry, Greenwich Meridian, Dr Who and Trillian.



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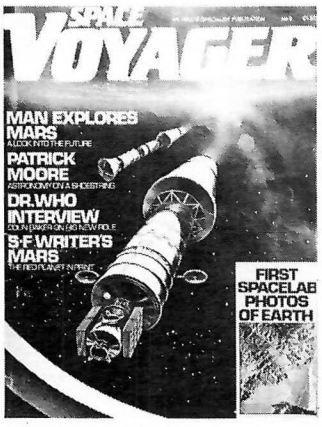

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Contents:
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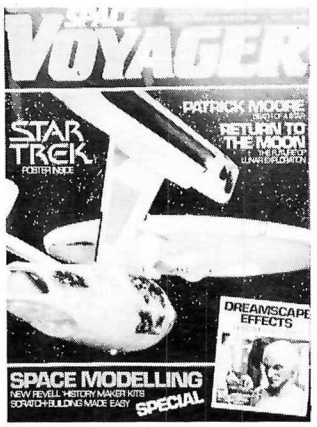

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COMMUNICATIONS BANK

One Hundred and Fifty-four

Surely you have more readers than that! Worse still, that figure includes FS4 membership as well!!

All this anger is directed at the (probably) millions of space enthusiasts 'out there' who did *not* write and tell Michael Marshall MP (and thus the world) that Britain *must* back Beggs. What a lazy lot you all are. You can spend £1.50 on *SV* but can't afford 17p and a post-card to get your weight felt!

Finally, I'd like to join with not a few others and say that you are doing an excellent job. Thanks for the Space Soc article in number 10. Keep the *'Blake's 7'* items flowing. Best of luck.

Cranbrooke *Peter Jones*
Ilford
Essex

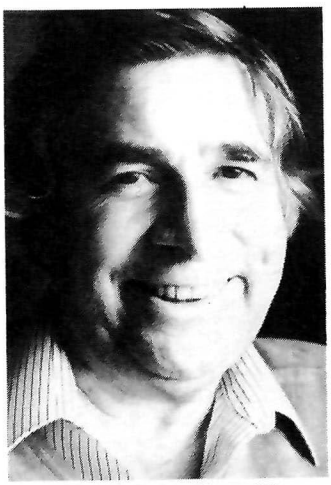
Well done to the 154 who did write. To everyone else. COME ON!

From the Great Bird

Thank you so much for the copy of the magazine containing the article about me which you wrote. I much appreciated your hard work in preserving the accuracy of what I had to say.

The most amazing thing of all to me, however, is the English attitude which embraces, in a magazine like this, every level of imagination from childhood science fiction to quite sophisticated theories. It reminds me how much I admire your theatrical people over there for being able to do television one day and Shakespeare's plays the next, solely on the basis of what the participant finds most challenging at the moment. The democracy of ideas.

Hollywood *Gene Roddenberry*
USA



Gene Roddenberry. **Photo: W. Graham.**

Dune Discussed

At long last *Dune* has made the transference from printed page to celluloid. Like its millions of readers I loved Frank Herbert's original book. I tried so hard to like the film and I did like it, but not enough.

The film was gorgeous to look at and Anthony Masters certainly created a look to his production design unlike anything seen previously. It is also stamped full of David Lynch's unique if slightly esoteric touches, particularly in the prescience dream sequences. The cast is marvellous and I even enjoyed the addition of the Third Stage Navigators (not in the first book) as the villains behind the scenes.

Kit West's mechanical effects were, as ever, marvellous, particularly the floating Baron. Brian Smithies model work was very good and the blue screen matte work was very passable, even the notorious Sandworms of Arrakis were, for the most part, very convincing. So what went wrong?

It would seem that having gone to the trouble and expense of creating the four worlds in *Dune*, someone ran out of steam with the script. Don't misunderstand me, the film is very faithful to the book but to its own cost. Whole scenes are lifted intact from the book, mainly action scenes, but most of the book's exposition has gone in order to fit the confines of a two and a quarter hour film and also to speed up the action. It is left to a one and a half minute prologue to explain very briefly about the Emperor, the Spacing Guild, Space Travel, the importance of the spice Melange, Arrakis, and the prophecy of Muad'dib.

Needless to say the people with whom I saw the film hadn't read the book and didn't have a clue as to what the film was all about.

Gone from the book is the religious fervour which explains Paul Atreides' lofty position of Messiah to the Fremen. Instead he becomes their leader simply because he can give them a powerful weapon. I know the film takes his religious position for granted because I read the book, but if the film is to be a successful film it must explain itself to an audience who have not read the book.

Still I did like the film, it showed me *Dune* and all its worlds and helped me with the correct pronunciation of its strange names. So my thanks go out to David Lynch. It was a nice try but I'd love to see the uncut version. By the way, does anyone know what Frank Herbert thought of the film?

Sefton *Barry Jones*
Merseyside

Kyle MacLachlan as Paul Atreides in Dune. **Photo: Universal Studios.**

It seems you either love Dune *or you hate it, when it comes to the film – or whether you understand it or not, for that matter, to judge from reviews in the national press. I blush to admit it, but I hadn't read the books before seeing the film, and I still followed what was going on, so what that means for the qualities of a national newspaper reviewer, I'm not sure.*

In answer to your last question does anyone know what Frank Herbert thought', well, we wondered, so we found out, and now you can find out by reading the interview with him elsewhere in this issue!

Transatlantic praise

I recently purchased your issue 12 several days ago and would like to say that I am very pleased with it.

Especially interesting was the article on the series *V*, which in my opinion is always worth watching.

Your magazine skillfully combines excellent artwork, interesting articles and a nice sense of humour. Other articles such as the one on Venus and Prepare to Meet Thy Doom are also nicely done. Keep up the good work.

Brooklyn *Gregory Carrubba*
New York
USA

Thank you on behalf of the writers of the articles you mentioned, Gregory, it is always nice to receive recognition. It is also nice to note that you appreciate our style of humour, most people in this country reckon our sense of humour doesn't cross the Atlantic.

Stamp Collection

I spend my time away from home as I am a seaman working on oil rig standby, and I enjoy reading *Space Voyager* when I can get hold of one. The crew of Guard 9 are contributing stamps to the Foundation for the Study of Infant Cot Deaths.

Lowestoft *Alex Hepburn*
Suffolk

We mentioned the appeal for stamps for the FSICD in issue 12, with the address passed on by Colin Baker, Dr Who. *To remind you all, that address is: Mr Alan Pryer, 51 Manor Drive, Hinchley Wood, Esher, Surrey KT10 0AZ, Great Britain.*

Blake and the Runestaff

On page 32/3 of *Space Voyager* issue 12 your reviewer WG reviews Michael Moorcocks *The History of The Runestaff*. Although a valid point is made, it could be a little misleading to new readers of Michael Moorcock's works. In your *New Voyager* No 1 page 29 *Blake's 7* Episode Guide, Episode one was transmitted on January 2 1978. The first Volume of *The History of The Runestaff, The Jewel in The Skull* was published by Lancer USA in 1968, and the final Volume *The Secret of The Runestaff* was published by Lancer USA in 1969. So, as you can see, a 10 year gap between the first edition of *The History of The Runestaff* and the first broadcast of *Blake's 7*.

South Ascot *D J Rowe*
Berks

Oops. I am reviewer WG and the howls from others who had spotted this reached me for days after publication. In my defence I'd seen Blake's 7 *before I read the books, but, to be fair for* 'Runestaff *is like* Blake', *please read* 'Blake *is like* Runestaff' *in future.*

Blake and Star Trek

Sorry to bring up the subject of *Blake's 7* once more, but after reading your *Star Trek III* review

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and rushing out to see the film, I was astounded at the number of similarities that it displayed with regard to that late lamented show; so many in fact that I am surprised that no one has written sooner.

The most glaring resemblance has to be, of course, the destruction of the Enterprise, which could be easily paralleled to the death of the Liberator (and Scorpio?). Also, the very essence of Kirk's search for Spock which bore a very strong resemblance to Avon's fanatical desire to find Blake and the ending of the film itself reminded me of the final episode of the third series of *Blake's 7* where the crew were trapped on a planet with their ship destroyed. Admittedly, Kirk and Company have a means of escaping off Vulcan but I am merely referring to the basic premise of the situation.

However, before I get *Star Trek* fans worried (and I do number myself amongst them, though only very recently) I am in no way suggesting that in *Trek IV*, Kirk will become a psychotic killer and shoot Spock, or that the whole of the regular cast will end up lying apparently dead on a dusty studio floor. I am merely pointing out some similarities that I have noticed.

It does seem ironic though that *Blake* was heavily criticised as being a cheap imitation of *Star Trek* and that now the latter seems to be incorporating touches of storyline from the former.

Sleaford *Mark Stone*
Lincolnshire

Be very careful before you liken anything to Blake's 7, *Mark (see the previous letter). I'll duck and let the howls from* Star Trek *fans blow you off your feet this time. It will be interesting to read what all the* Blake's *and* Star Trek *fans have to say on this one.*

Screening order

I write with reference to Phillip Rochester's letter in *Space Voyager* 12, in which he states that the BBC are screening the first season *Star Trek* episodes in order. If he posseses, as he seems to imply, the *Star Trek Compendium* by Alan Asherman he will see that in fact episodes 4 and 5 have not yet been seen. Similarly he will see in the same book that the production credits for the second pilot list William Shatner as playing James *R* Kirk. Obviously, in the beginning, Gene Roddenberry had not yet thought of changing the R to a T for Tiberius so the gravestone was correct.

As regards the 'forbidden' episodes, I worked for Paramount TV in London for a while and asked them why the censorship. They said that it had something to do with questions about Nuclear warfare raised in the programmes. If this is so it seems particularly petty on the part of the BBC in the light of such recently screened 'doom and gloom' programmes such as *The Day After* and *Threads*.

Westerham *Simon Goodall*
Kent

Episodes four and five are listed in the Compendium *as* Mudd's Women *(4) and* The Enemy Within *(5), and were finally shown in reverse order.*

I can't think of any nuclear warfare connotations in the four unshown episodes – Miri, The Empath, Plato's Stepchildren *and* Whom Gods Destroy. *Can anyone else?*

Trek reprieve?

Your reply to C A Smith (*Space Voyager* 13) on the subject of the banned *Star Trek* episodes prompts me to make a few comments on the subject. The 14-20 July 1984 issue of *Radio Times* published a letter from Kelvin Dickinson asking whether the BBC planned to show the banned episodes. The 'official' reply was this: 'The content of all four is considered unsuitable, and they will not be seen among the present repeats.'

This policy remained firm until the 4-10 August edition of *Radio Times*, which contained three letters on the same subject. This time, a detailed reply was given by Barry Brown, the Head of Purchased Programmes at BBC Television, who explained that when *Miri* was screened in 1970 the BBC received a barrage of complaints from parents of younger viewers. In the light of this, future episodes were examined closely and a further three episodes (*Plato's Stepchildren, The Empath* and *Whom Gods Destroy*) were withdrawn. 'When negotiations took place to rescreen the series', explained Brown, 'these episodes were omitted'.

All is not lost, however. In the same reply, Barry Brown stated that 'In the light of current correspondence, we shall endeavour to reassess these episodes as the climate of public opinion seems to have changed, and perhaps try to acquire them for future transmission.' This, remember, was way back in the summer of '84, and not a word has been said since. But who knows, even as I write, steps may be taken to ensure that these episodes will be screened.

Broadly speaking, I'd agree with you about the double standards of the BBC. Four-letter words and nudity are okay when they're in 'upmarket' plays like *Oxbridge Blues*, and full frontal nudity rears its ugly head in series such as *Tenko* – yet serious treatment of important subjects is often suppressed. And it's not only *Star Trek*, folks – latest casualty is the superb police series *Cagney & Lacey*, certain episodes of which are considered to be 'unsuitable' (it's that word again).

Having said all that, though, I'd still prefer to watch such series on BBC television rather than Channel Four, whose shabby treatment of some series isn't determined so much by concern for public morals but by sheer pig-ignorance (showing *The Prisoner* in the wrong order, purchasing cut prints of *The Avengers* instead of complete versions, etc). I'm hoping that if *The Outer Limits* makes it back to the small screen it'll be on BBC2 again rather than Channel Four. Mind you, BBC2 isn't perfect – hasn't anyobe else noticed that after an enthusiastic start, BBC2's screenings of *The Twilight Zone* have grown further and further apart, to the extent where we have to wait months between episodes?

But enough of my moaning. A few words now in praise of *Space Voyager* itself, which is going from strength to strength. I particularly appreciate the new feature For Your Information, which is far superior to the gimmick-laden 'advice column' in a certain rival magazine. I was especially interested to learn that Anthony Lebaron was the pseudonym of Keith Laumer (who, readers may like to know, wrote three paperbacks based on *The Avengers: The Afrit Affair, The Drowned Queen* and *The Gold Bomb* (Berkley Medallion, 1968).

Oh, and by the way, it wasn't only in the American editions of the *Space: 1999* paperbacks that photographs from the series were included. I have a copy of Michael Butterworth's *Mind-Breaks of Space* (Star, 1977) containing eight pages of photographs – the captions are extremely inaccurate in some cases, though.

Okay, that's your lot. In closing, though, I'd like to thank you for the centrespread of Didi the Dimorphodon – very cute, and extremely well made.

Mayhill *Graham P Williams*
Swansea

Walter Koenig at SOL 3. **Photo: W. Graham.**

Where was Chekov?

I have been reading *Space Voyager* since the article on *Star Trek II, The Wrath of Khan*. I remembered watching the *Star Trek* serial a week before and seeing the episode *Space Seed*. While the episode was on I was thinking of the parts of the film which were to continue as *Wrath of Khan*. I noticed that there was no Chekov (Walter Koenig) in this episode.

So, since Chekov wasn't in this episode, how did he know Khan on Ceti Alpha V?

Also on *Star Trek, Search for Spock*, why did they have to destroy the Enterprise? What will become of the fourth *Star Trek* movie (if there is one)?

Rhyl *Christopher Ng*
Clwyd
Wales

Walter Koenig was asked this very question when he was at a convention over here (SOL III, Birmingham, May '83), and his answer, as given in my interview with him in issue 7 of Space Voyager *was: 'Well, you see, Chekov had an attack of the 'gallactic grunge' while Khan was aboard (in* Space Seed*) and was stuck in the 'head' the whole time. At one stage Khan caught a touch of the same – he was very susceptible after his long sleep – and had to queue. When Chekov finally came out Khan was in a rare old state and that's when*

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he promised to remember Chekov. . . '

So that's what we must call the definitively correct answer, because if Walter doesn't know, who does.

As far as I know, there will be another Star Trek *film, but as to which ship they will have. . .*

V Query

Please could you tell me the name of the actor who played Martin in the science fiction series *V*.

No-one remembers that it was Martin who helped Mick many times at great risk to himself and his friends. Martin was the main reason I watched this very enjoyable series.

Glasgow *Margaret Sweeney*

Martin was played by Frank Ashmore, and was the alien who helped Mike Donovan several times aboard the mother ship and on Earth.

Photo Request

I have been with *Space Voyager* since its first issue and feel you have the mix just right. The only suggestions I can make for improvement would be to offer for sale some of the fine stills you use to illustrate the magazine, and also for you to organise a charter flight to see a shuttle launch.

Withington *Alexander Sinuhs*
Manchester

Sadly we couldn't sell copies of stills which appear in Space Voyager *because the copyright for them is vested with the producing companies usually. However, a polite request to the companies might bear dividends, or specialised SF shops can sometimes supply photographs.*

Is anyone else interested in a charter flight to see a shuttle launch?

V Credibility

I was interested in John Peel's review of *V* (*Space Voyager* 12). However, my view is not the same as his. As usual in most American SF made for television it degenerated into fantasy.

A human/alien 'lizard' mating producing a viable offspring and for that offspring to stop a runaway nuclear reaction by the 'laying on of hands' just stretches credibility to breaking point.

What is the point of having aliens if they are not treated credibly and if they become incidental why introduce them at all? Now how about a review of a television SF series which has a basis in reality and is credible, namely *The Tripods*.

Kibworth Harcourt *Mike Healy*
Leicestershire

Britain in space

I was pleased to read the interesting letters from Graham Yates and I F Hardy in Communications Bank, issue 13. However, I must point out that I'm no longer President of FS4. Due to pressure of other work, I had to step down at our last AGM. I guess Graham wrote his letter prior to receiving details of this.

FS4 is now under the very capable Presidency of Dr Graeme Duncan, an expert on space medical affairs. I have retained my position as chairman of the political sub-committee, and am also still President of the Space Settlers' Society within FS4.

In the latter capacity, I'll be very keen to discuss the other points raised in the letters – or indeed any point any *Space Voyager* reader wishes to bring up, at Triple-S Con at Cardiff in July of this year (see ad elsewhere in this issue). But in the former, I feel I ought to point out here that there are other options open to British spaceflight than those put forward by Graeme Yates.

Contrary to what some of our media would have us believe, Britain is a major, not a minor contributor to ESA, even though we may not contribute much money to Ariane. There is also private enterprise. Convince even British industry of the profit to be made from space, and we'll get there very fast. I cordially invite all *Space Voyager* readers to come along to Triple-S Con and help us determine the best way of going about this.

Ingleneuk *Andrew Nimmo*
Waterside Road
Kirkintilloch, G66 3HB

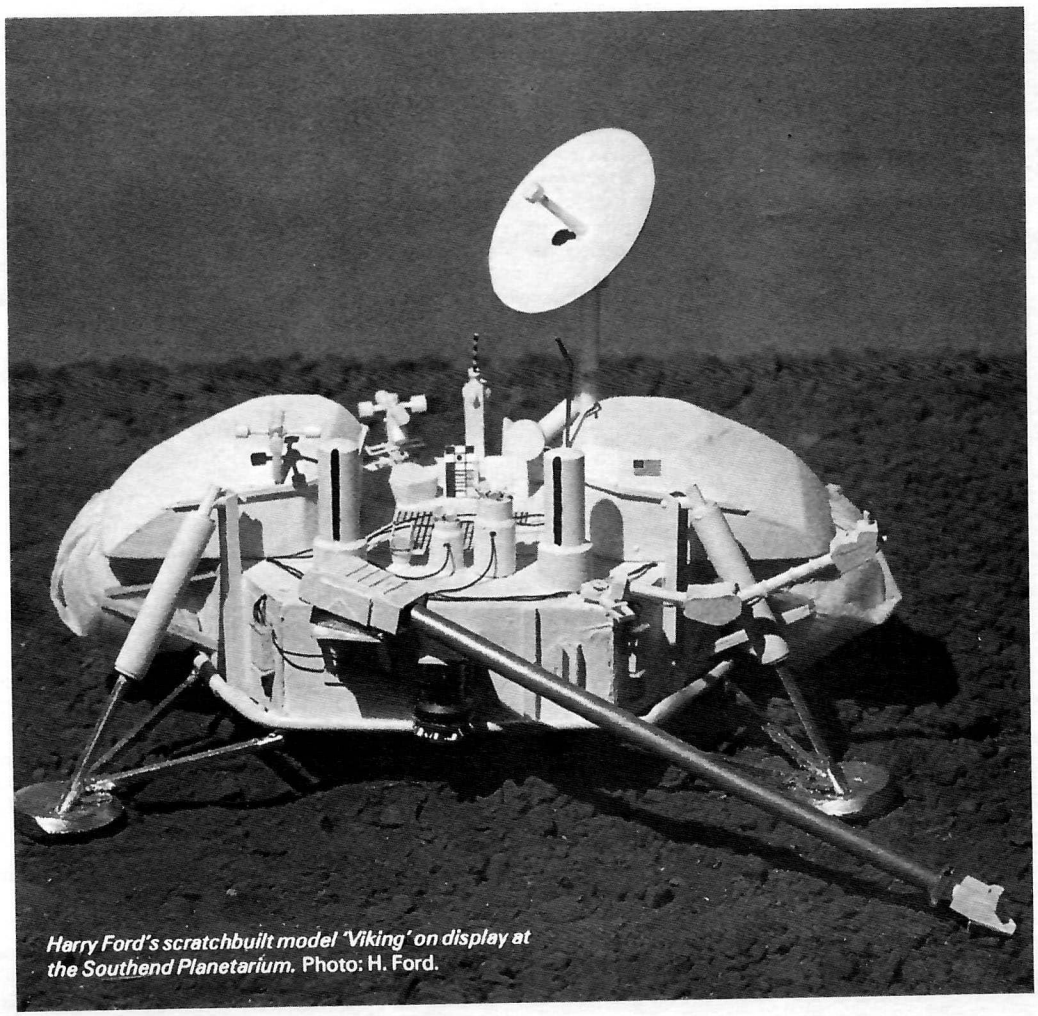
Planetarium models

I wish to say how much I enjoy *Voyager* magazine. I have taken it since the first edition.

You may be interested in slides of two of the models to be used for display purposes in my Southend Planetarium. They are made mostly from Balsa wood and scrap, although now I am using 'plasticard'. The 'Viking' is 1:24 scale and I am working on the Hubble Space Telescope, Voyager and Giotto. For this last I am grateful for the photos of Giotto you have published, although I have many drawing from British Aerospace itself.

Incidentally the Martian surface under the 'Viking' is red sandstone gravel from the bed of the river Tay in Scotland. I do not know if you would be interested in publishing these photos to encourage younger readers in model making.

Westcliffe-on-Sea *Harry Ford*
Essex



Harry Ford's scratchbuilt model 'Viking' on display at the Southend Planetarium. Photo: H. Ford.

SHUTTLE UPDATE

AFTER A PAUSE, SHUTTLE FLIGHTS ARE PICKING UP AGAIN IN FREQUENCY. GEOFF ENDACOTT BRINGS US UP TO DATE ON WHAT IS HAPPENING AT THE CAPE.

Yet another chapter in the history of space exploration has been written with the successful capture and return to Earth of two errant satellites. The astronauts aboard Space Shuttle Discovery managed to capture the Palapa B-2 and Westar VI satellites and return them safely to Earth.

The first satellite to be retrieved was the Indonesian Palapa B-2. Everything went well at first as Commander Rick Hauck and Pilot David Walker steered the Shuttle alongside Palapa.

Dale Gardner and Joe Allen then emerged into the Payload Bay where Allen donned one of the Manned Manouevring Units. Flying with a long docking probe called a 'Stinger' in front of him, Allen flew over to Palapa. He inserted the Stinger into the rocket nozzle at the bottom of Palapa and managed to dock with it. He then used his rocket jets to stop the satellite spinning.

Meanwhile, Anna Fisher was waiting inside the Orbiter at the controls of the Robot Manipulator System arm. She moved the arm over to the satellite and used it to grapple the Palapa-Allen combination. The robot arm was actually attached to a special fixture on the side of the probe which Allen had inserted into Palapa.

Hi-Tec cutters!

Allen and satellite were gently moved by Anna Fisher towards the Payload Bay where Dale Gardner was waiting. His first task was to remove a small antenna protruding from the top of the satellite. The antenna looked rather like a car radio aerial and Gardner removed it in a rather brutal manner. He chopped through it with a pair of shears bought from a hardware store!

So far things had gone very well, but then the problems started. At this stage, Allen and the robot arm were attached to the bottom of Palapa. However, it was the bottom of the satellite, which had to fit into a cradle in Discovery's Payload Bay. Palapa had to be turned around.

The original plan called for Gardner to attach a special bridge structure over the top of the satellite. Anna Fisher would then move Palapa away from the Shuttle with Allen still attached. The robot arm could then be disconnected. With Allen's backpack keeping Palapa steady, the robot arm would then be attached to the newly fitted bridge structure.

It was important to hold the top of the satellite steady, because Gardner then had to fix a berthing adapter to the rocket nozzle at the bottom. Only when this was achieved could Palapa be safely locked down in place.

Improvisation

NASA have a reputation for not being beaten and a new procedure was duly evolved. If the robot arm couldn't hold the top of the satellite, Joe Allen would have to do it with his hands!

The idea worked. Allen was able to steady the satellite while Gardner attached the berthing adapter. Palapa was finally locked down into place and two very tired astronauts crawled back inside the Shuttle.

Although one of the satellites had been safely stowed, the astronauts still had Westar VI to contend with. If the bridge structure didn't fit Palapa, would it fit Westar? Mission Control decided not to find out and instead told the astronauts to adopt the same procedure used for Palapa. The astronauts were not very happy at the prospect . . .

Although it may seem easy to hold a weightless satellite in your hands, its mass is the same as it would be on earth. One false move and Allen could easily have damaged himself, the spacecraft, or both.

It was eventually agreed that they had no choice but to use the same method with Westar. The second rescue was successfully accomplished and both satellites have now been safely returned to Earth.

The owners of Westar VI have been paid $105 million as a result of their insurance claim and the Indonesians were paid $80 million for Palapa B-2. The second-hand satellites have therefore become the property of the insurance companies. All they have to do now is find someone to buy them.

Flight delays

The tile problem with Challenger has resulted in the expected delays to the 1985 Shuttle programme. Priority has been given to the military payload which should have flown on Challenger in December 1984. This is now booked for the Orbiter Discovery and at the time of writing was scheduled for launch on January 23.

Note: Since time of writing, Discovery's flight was delayed for one day by cold weather. The mission ended safely three days later, having successfully put the satellite into orbit.

The postponement of the military mission has had a knock-on effect on the other Shuttle flights. Paying customers have been given precedence over scientific missions, so the Spacelab flights have borne the brunt of the delays.

Spacelab switch

Spacelab 3 lost its January launch slot and Orbiter Discovery to the military team. Spacelab 3 now moves to Challenger in April with the launch slot previously assigned to Spacelab 2. Spacelab 2 is now due to fly aboard Challenger in July.

The crew members on the first ever military Shuttle mission come under the command of Apollo veteran Tom Mattingly. His Pilot is Loren Shriver and Mission Specialists are James Buchli and Ellison Onizuka. A late addition to the crew was made in the shape of military Payload Specialist, Gary Payton.

Tom Mattingly is one of NASA's most experienced astronauts. He travelled to the Moon in1972 as Command Module Pilot of Apollo 16 and stayed in orbit while John Young and Charles Duke explored the surface. Ten years later, Mattingly commanded the fourth Shuttle flight.

Mattingly has announced his intention to retire from NASA after the January mission. His last flight marks the end of an era as none of the other Apollo astronauts are likely to fly again.

Satellite Secrecy

The mission itself has been the source of some controversy. Unlike the previous fourteen Shuttle flights, NASA is refusing to confirm the nature of the payload. The exact launch time and duration of the mission are also classified and NASA will not announce whether or not the crew succeed in their objectives.

The payload at the centre of the argument is almost certainly a military signals intelligence satellite called SIGINT. The satellite is designed to intercept Soviet signals and relay the information gained to the USA.

SIGINT was due to be placed into geostationary orbit by the troubled Inertial Upper Stage. This is the rocket which failed on its first launch in April 1983, leaving the first NASA Tracking and Data Relay Satellite in the wrong orbit. The SIGINT deployment is only the second attempt to use the Inertial Upper Stage.

Although NASA will not reveal the outcome of the military satellite deployment, the second Shuttle mission of the year should give a clue. The flight was scheduled to include the deployment of the second NASA Tracking and Data Relay Satellite.

Like SIGINT in January, the NASA satellite is due to be carried by the Inertial Upper Stage. If anything goes wrong in January, NASA will almost certainly delay the launch of the second Tracking and Data Relay Satellite. If the mission goes ahead as planned it will be a reasoanble indication that no problems were encountered with SIGINT.

Karol Bobko is the Commander of the flight, which will also launch the Telesat-I communications satellite. He is joined by Pilot Donald Williams and Mission Specialists Rhea Seddon, Jeffrey Hoffman and David Griggs. Payload Specialists Patrick Baudry and Senator Jake Garn complete the crew.

Bobko and his team were due to blast off on 20th February in Space Shuttle Challenger, provided that its tiles had been repaired by then.

Discovery starts its second flight of the year on March 19 with a mission to retrieve the Long Duration Exposure Facility. Commander Daniel Brandenstein and his crew will also launch the third Syncom IV satellite. Discovery's Pilot will be John Creighton and Shannon Lucid, John Fabian and Steven Nagel are the Mission Specialists.

Payload Specialists Charles Walker and Gregory Jarvis complete the crew, making this the second mission to carry seven people. Jarvis is an engineer from the Hughes Corporation who designed and built the Syncom IV satellites.

Walker is employed by McDonnell Douglas and he will be making his second Shuttle flight. He made his first trip into space on Discovery's maiden flight at the end of August 1984, when he operated the Continuous Flow Electrophoresis System.

Flight experiments

Electrophoresis is used to separate materials in solution by subjecting them to an electric field. A continuous stream of biological material is injected into the bottom of the equipment. When the field is applied the solution divides into separate streams which are collected at the top.

On Earth, the force of gravity swamps the small electrical force which is applied. The method therefore works much better in the microgravity environment of space. The long term hope is that electrophoresis will allow commercial quantities of drugs to be made in space, but that prospect is still a few years away.

During his flight in August, Walker attempted to separate a hormone for use in Laboratory tests. Unfortunately, the material he produced was subsequently found to be contaminated and the activity of the hormones was either masked or destroyed. McDonnell Douglas have now changed the sterilisation procedures and are hoping for better results this time.

The postponed Spacelab 3 mission is now due to be launched on April 30 with the Orbiter Challenger. The crew will once again comprise seven people. Spacelab 3 will be under the command of Robert Overmeyer. Frederick Gregory is the Pilot and Don Lind, Norman Thagard and William Thornton are the Mission Specialists. Scientists Lodewijk van den Berg and Taylor Wang fly as Payload Specialists to complete the team.

The experiments on Spacelab 3 are concerned with microgravity and will pay particular attention to the way in which it affects the human body.

Three into orbit

Three satellites will be carried into orbit by Discovery when it makes its third flight of the year. Commander Joe Engle, Pilot Richard Covey and Mission Specialists James van Hoften, John Lounge and William Fisher are due to lift off on May 30. The satellites were originally due to be carried by Columbia, but the veteran Shuttle's major refit will not be completed in time.

The three satellites to be launched from Discovery are Telstar-3D, Morelos-A and Arabsat-A. All three are geostationary communications satellites.

Telstar-3D was built by Hughes Aircraft for the American Telephone and Telegraph company. Morelos was also manufactured by Hughes and is destined to become Mexico's first domestic communications satellite.

Arabsat-A was constructed by the French company Aerospatiale for the 22 nation Arab League. A second Arabsat is scheduled to be launched by the European Space Agency's Ariane.

A Payload Specialist from Saudi Arabia will join Engle's crew making them the fourth nation to put an astronaut aboard the Shuttle (not counting the USA).

International Crews

The first non-American Shuttle astronaut was Ulf Merbold from West Germany who flew aboard Columbia in November 1983. Canada saw their first Payload Specialist carried aloft when Marc Garneau joined the crew of Challenger in October 1984.

France were due to become the third guest nation with Patrick Baudry's February mission in Challenger.

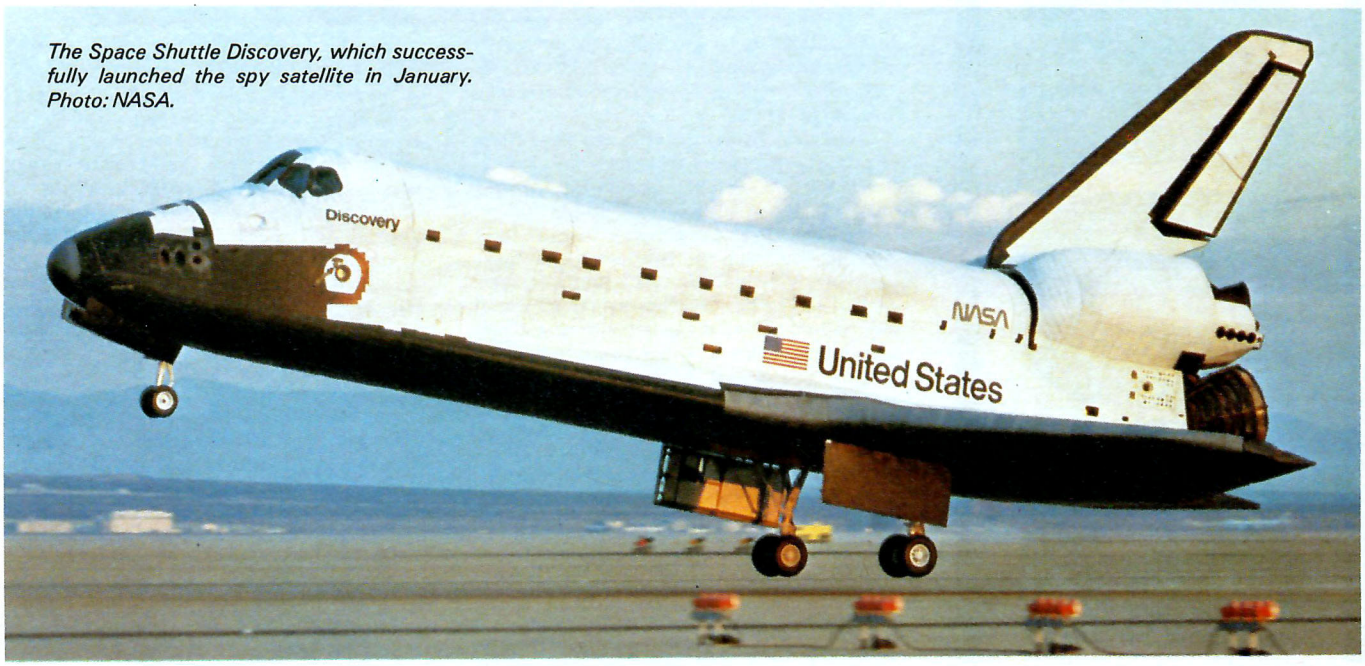
Holland will join the list of Shuttle nations when Wubbo Ockels joins the Spacelab D-1 crew and he will be joined by two more West Germans, Reinhard Furrer and Ernst Messerschmid. The mission was due to be launched in October, but delays to the first flights in 1985 may see this date slip by a few months.

Switzerland will have their first astronaut when Claude Nicollier flies as a Mission Specialist on the first Earth Observation Mission. Payload Specialists from India, Indonesia and Japan are also due to join Shuttle crews.

Last but not least come Britain's four astronaut candidates, one of whom will become the first Astrobrit in 1986.

The sixth Shuttle mission of 1985 will be the much delayed flight of Spacelab 2, which is now planned to start on July 9. Roy Bridges has replaced David Griggs as Pilot, but the rest of the crew is unchanged. Gordon Fullerton remains as Commander. Story Musgrave, Anthony England and Karl Henize fly as Mission Specialists with Payload Specialists Loren Acton and John-David Bartoe.

The Spacelab 2 team will conduct experiments concerned with Astronomy, Biology and Physics.



The Space Shuttle Discovery, which successfully launched the spy satellite in January. Photo: NASA.

DUNIVERSE

AS *DUNE* NOW HITS OUR REGIONAL CINEMAS, IT SEEMS LIKELY THAT THERE WILL BE A *DUNE 2* SO NEIL GAIMAN INTERVIEWED FRANK HERBERT, SAW THE FILM AND TALKED TO SOME OF THE STARS, THE DIRECTOR AND PRODUCER.

Frank Herbert

You do get a lot of rubbish in publicity handouts; the one that they sent me for the *Dune* film begins 'Frank Herbert's science-fiction book *Dune,* first published. . .in 1965, was that troubled decade's literary lodestar,' and goes on to explain that it was a 'life-affirming metaphor: in which positive human potential, developed to its highest power, prevails ultimately over even the most deeply entrenched evil.'

Dune wasn't the 'literary lodestar' of the Sixties. But it is one of the best-selling SF books ever, a complex mixture of intrigue, adventure, mysticism, religion and ecology; a fat and satisfying book that has spawned four sequels, with at least two to follow. And now it's been made into a film starring Sting, Sian Phillips, and newcomer Kyle Maclachlan as hero Paul Atreides.

I spoke to author Frank Herbert about both the book and the film on his recent visit to England. He's an American ex-journalist, a science fiction writer for over thirty years.

How much was he consulted during the making of the film?

'Every step of the way. I went down to the Mexican desert where they were filming, acting as technical adviser. I saw the four major cuts of the movie, and made my suggestions to them, some of which were followed. They made a commitment to be as close to the book as they could, and they did – they carried out their promise. In one sense I had a big club in my hand and never waved it. That is that there are approximately sixty million people out there who have read *Dune,* and so all I had to do was murmur quietly 'remember the facts.'

'It is *Dune.* They've got it. It begins as *Dune* begins, it ends as *Dune* ends, and you can hear my dialogue all the way through it. My only objection is that they cut out one character, Count Fenring, and one scene I would have loved to have had, the banquet scene. But I know why they did that, it's a time consideration. It's a two hour and twenty minute film; if they had shot every scene in the book it would take at least fourteen hours. David Lynch (the director and writer) deserves full credit for solving how to translate *Dune* to the screen.'

How closely did they work together on it?

'Oh, David milked my brain like a farmer with a cow in a stall. After seeing *'Elephant Man'* I just knew in my guts we had the right man, capable of doing it. And David taught me how to write screenplays. It was a real rapport, I taught him a lot about *Dune,* he taught me a lot about scriptwriting.'

Original Concepts

Where did his original ideas for Dune come from?

'I suppose, from my study of history. It's my belief that Messiahs ought to have a label on their foreheads, *'Warning – may be dangerous to your health!'* Not that Messiahs individually are bad, all of them, but inevitably they create power structures, and other human beings come to absorb those power structures. My view of history is that we are fools to follow any leader without question; the power structure develops, and power structures attract the corruptible. It's not true that power corrupts, and absolute power corrupts absolutely. I don't believe that. What I do believe is that power attracts people who are corruptible. Adolf Hitler. Gadaffi. Richard Nixon – he's one of my heroes: NIxon taught us a marvellous lesson, he taught us to distrust government, and he did it by example. And that's a lesson we need to have recurrently.

'I conceived *Dune, Dune Messiah* and *Childen of Dune* as one book. The structure for the first three books was already in my head when I started – not just in my head, but on paper. The structure of it was to create a Messianic leader, who people would follow for all the right reasons, whose activity produces that power structure, then show the devolution of it – in other words flip the story over with the middle book, then show where the devolution goes in the third book. The next generation, the passing along of the power.'

So how did the fourth and fifth books come about?

'Well, the fourth one came about because I couldn't get the character out of my head. Leto, the God-Emperor. I kept wondering what it would be like to have a civilisation ruled by one person for thousands of years. The mindless monster together with the human being, wearing the same flesh. And one thing an author has in reserve is that he can write the character into a book and kill him off. Which I did, of course.'

I told him that my favourite of the series, after the first couple, is the latest, *Heretics of Dune.*

The Atomic Worm

'Yeah, I really enjoyed writing that one. You'll enjoy the sixth one, *Chapterhouse Dune,* then. The sandworm that they took with them when the planet Arrakis was destroyed has all kinds of offspring now, so we have explosive growth. The atomic worm.'

Now, the three great campus classics of the Sixties were probably *Stranger in a Strange Land, Lord of the Rings* and *Dune.* Why did he think those three books captured the public imagination in the way they did?

'I'm not sure. I really am not. I've been asked this question about *Dune* a lot of times, and with *Dune* I think it's because you can follow the action on a lot of levels, on any level that appeals to you. As far as Heinlein's work goes, it was a popularisation of a childhood fantasy – 'Big Daddy will take care of you.' *Lord of the Rings* is a translation of the Arthurian legend. And I based a lot of *Dune* on Arthurian Legend – I had equivalent characters: the Prince in search of the grail; the witch queen; the wise old man; the fool (in the tarot sense, not in a contemporary pejorative sense); the magician, the one who could talk to animals; and so on. The archetypes are all there, and I did that deliberately.'

And does he feel these levels all come across in the film?

'I think so. What you get out of the film depends on your age and sophistication. Kids may go to see the baddies slashed and the war, and the bad man floating in the air. People are going to go to see the love story. Other people are going to see the adventure story, or the mystical story, the creation of the messiah, and all that.'

Will people who enjoyed the book be disappointed by the film?

He shook his head. 'I think the fans will react as I did. People say 'are the visualisations true to my imagination?' And the answer is, some of them are, some of them aren't, and a lot of them are better! Carlo Rambaldi didn't win his Oscars (for Special Achievement Visual Effects on *King Kong, Alien* and *ET*) for sitting at home playing with clay. David Lynch started out as an artist, a painter. The film itself is a visual feast – you want to stop the frame occasionally and hang that one on your wall!'

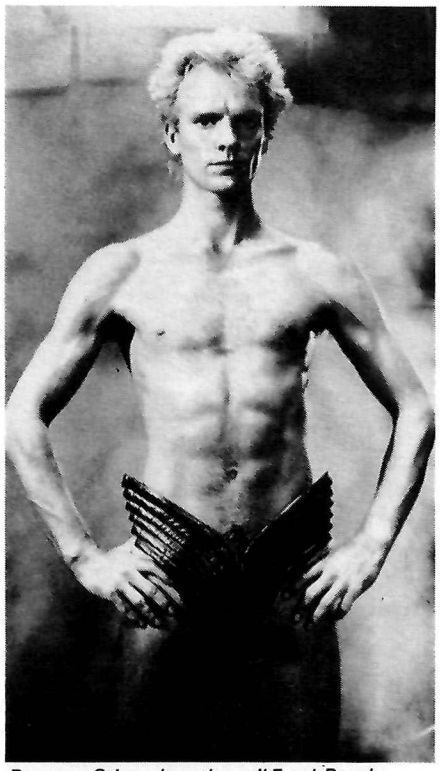
Religion in *Dune*

We begin to talk about the various religion in *Dune*. 'They are all evolutionary projections out of current religions. And 'The Orange Catholic Bible' is my own private joke. Personally I avoid organised religion. My own belief is that we live in a hologrammic universe – I think every element of the universe contains the whole – and one of the assumptions out of this is that nothing is ever lost, at least in some form. No good, no evil: nothing is ever lost. So what do you put into that cosmic hologram? My own personal choice is to live by the Golden Rule – try not to do to others those things you would not like them to do to you – not always successfully, I'm afraid. But I think that if only one person in our universe or in this world does this then it is a better world, so we ought to do it. But not as a preachy 'You're a bad guy because you don't.' It has to be a personal choice. Made for personal reasons, not because somebody laid it on you.'

In the *Dune* books society frowns on technology, and Spock-like human computers, Mentats, do much of the work that would now be done by technology. Does he have any dislike of high-tech?

'I don't think that it's the axe that cuts down the forest. It's how the tool is used. You have to be pretty dense to think it's the tool that is at fault. I believe that – progress is the wrong word – I believe that the evolution of technology is inevitable. Progress is a peculiar word. It's a windowscreen we pull down to hide the future from ourselves. It's the sort of word that doctors use, you know 'How is the patient doing?' 'Progressing marvellously' when in fact the guy just died.'

'You know, I started out in history, and it's always fascinated me, through omniverous reading. You can see certain cyclical elements in history – we meet ourselves coming around, like the Worm Ouroboros. But we don't truly repeat precisely – it's more of a spiral than a circle, like a spring. And that's human progress.'



Pop-star Sting plays the evil Feyd-Rautha, nephew of the Baron Vladimir Harkonnen.

Enthusiasm

'It's like my book, *Dragon in the Sea*. People read that and ask if I was being prophetic. I say, no. I was just writing about something that, it was clear to me, was happening. It was 1954 but I could see that there were going to be oil shortages. I said that in the book. And there was. I said that it was going to get better then worse. And it is. But it's obvious if you study history. If you're a historian of any merit at all, you see the currents. A good navigator in a river gets to read the currents and knows where the rocks are. A good historian does the same thing.'

His enthusiasm for *Dune* and the forthcoming film is very infectious. He is an excellent PR. 'Well, the agreement that we had was that if I didn't like it, I didn't have to say anything. If I liked it I'd be delighted to go out and say so. And I like it. That's the bottom line.'

What are his plans for the future?

'To continue working. I enjoy working. I'm doing screenplays – we're already working on the sequel, *Dune Messiah,* and I'm working on a collaboration with my son, it's his sixth book. And I'll do a seventh *Dune* book (probably the last, but I'll never say never again on the *Dune* series). And I try to keep a free-flowing, ever-changing attitude to the world, which I think everyone ought to have. I went through a recent traumatic event – the death of a wife I have loved very much for a long time. My reaction to this was to get myself into better physical condition; I lost fifty pounds (only four ounces of which was the beard, I swear to you!) and I put my life back on the rails. I'm alive. And I'm doing what I want to do.'

How do you catch a cloud and hold it down? How do you keep a wave upon the sand? How do you hold a moonbeam in your hand? And – last, but not least – how do you turn a 800-page book (which has been read by an estimated sixty million people, and which is crammed choc-a-block full of high intrigue, complex characters and enough plot to keep Coronation Street going for the next three thousand years) into a two-hour film? With great difficulty, that's how. Not that *Dune* is unfilmable; you'd simply need an eighteen hour film. But David Lynch, aided and abetted by Rafaella de Laurentiis, has done his best.

The Story

The story of the film is the story of an emerging messiah, Paul Atreides (Kyle MacLachlan). Paul is the end result of a many thousand-year genetic breeding program instituted by the Bene Gesserit sisterhood with the aim of creating the *Kwisatz Haderach,* a being able to see into the future, possessed of many supernormal powers, able to see into that place which, we are informed, women are unable to look.

Paul's mother, the Lady Jessica (Francesca Annis) was Bene Gesserit trained herself, and was meant to have borne a daughter to her husband, Duke Leto (Jürgen Prochnow), head of the House Atreides and ruler of Caladan. The daughter would have been married to a male heir of the Harkonnens, hereditary enemies of the Atreides, and brought peace between the two families; then, in her turn, the daughter would have produced a son – perhaps the lengendary Kwisatz Haderach. Out of love for Duke Leto, Jessica disobeyed the sisterhood and had Paul instead.

The Atreides are becoming too popular. Now the Emperor of the Known Universe, Shaddam IV (José Ferrer), has allied with evil

Francesca Annis plays Atreides' mother, Lady Jessica.

Above, wounded Paul Atreides (Kyle MacLachlan) and friend with close shave! Below, Atreides pins Feyd to the floor – spot the deliberate mistake!

British actress Francesca Annis plays the beautiful Lady Jessica.

House Harkonnen to bring down the House Atreides: Arrakis, also known as Dune, is a desert planet and the only source of the Spice Melange (without which much of the Universe would be in great difficulty) long been run by the Harkonnens; The Emperor appoints the Atreides as new rulers, while plotting with the Harkonnens to destroy the Atreides.

As the film begins much of this is explained in a rapid resume by the voice of the Princess Irulan, daughter of the Emperor. We then meet one of the grossly deformed Third-Stage Navigators of the Spacing Guild, warped and changed by continual exposure to the spice (without which the navigators cannot predict the future and thus transport ships through space). It has come to warn the Emperor that the Guild will not countenance anything that would endanger the safe production of the spice, that the Guild will only go along with the Emperor's plan if he ensures that the Atreides heir, Paul, is killed.

Meanwhile, on Caladan, Paul receives a visit from the Reverend Mother Gaius Helen Mohiam (Sian Phillips), a Bene Gesserit bigshot equipped with a poisoned needle – the gom jabbar – and a pain-inducing box. He passes her test: could he be the Kwisatz Haderach? He has been having odd dreams of the future, and of a planet called Dune, which would tend to indicate something of the kind.

Dune/Arrakis, is a waterless planet, inhabited by nomadic warriors called Fremen, who owe their existence to their hyper-efficient water conserving garments called stillsuits: the Fremen have a prophecy that one day The Promised One will come and lead them in holy war against the universe. Apart from the Fremen and the sand Arrakis his little else to offer except for enormous sandworms – huge creatures up to a mile long.

Shortly after the Atreides arrival on Arrakis they are betrayed by the Harkonnens, who have suborned loyal Doctor Yueh (Dean Stockwell). The Harkonnens, led by Baron Vladimir (Kenneth MacMillan), look like red-headed punk black-dressed Michelin men. They kill Duke Leto, and The Beast Rabban (Paul Smith), one of the Baron's nephews, takes over as planetary head.

Paul and his mother flee into the desert, where, after a close encounter with a sandworm, they are adopted by Stilgar (Everett McGill) and his Fremen warriors. Paul trains the Fremen to use the Atreides vocal weapons, and they launch a commando-style war of attrition against the Harkonnens, bringing the spice production to a halt. Meanwhile the pregnant Lady Jessica has drunk the Water of Life and become a Reverend Mother, and Paul has drunk the same mysterious liquid (a form of pure spice) and seen into that area that women can't go [it looks a bit like an oily pool] becoming the Kwisatz Haderach.

The Emperor, on the orders of the Spacing Guild, invades Dune, intending to destroy all life on the planet. He decapitates Rabban and castigates the Baron. But Paul (now called Muad'dib) is many steps ahead of him. With atomic weapons, sandworms and thousands of worm-riding warriors he moves in, and after a pitched battle, defeats the Emperor's forces. (The Baron, meanwhile, has floated out of a window and been eaten by a worm).

At this point Paul has a knife-fight with the Baron's only surviving nephew, Feyd Rautha (Sting) (a Harkonnen who, until now has done little except stand in a stream bath with almost nothing on, looking pretty) and defeats him. Paul takes over as Emperor, marrying the Princess Irulan (remember her?) and, to symbolise the astounding changes, causes it to rain on Arrakis for the first time in living memory.

The Review

Visually, it is a treat. The sets are magnificent, and designed to show the different aspects of the different planets. The Emperor's palace, all jade and gold, like a Rennaissance cathedral; the Atreides castle on Caladan, built entirely of wood; The industrialised Harkonnen world of Giedi Prime, all metal boxes floating on an oily sea, for all the world like a gasworks that has grown to engulf a planet; Arrakis itself, crudely hewn rock and vast sandy deserts.

The special effects, as one has come to expect in modern cinema, are impressive – often so well done that one merely takes them for granted.

The Harkonnens are fabulous – the baddest, most wickedest, evillest, cruellest, unpleasantest family to appear on the screen for years: the Baron, floating around in mid-air, corpulent, diseased and insanely destructive; The Beast Rabban, a mindless sadist who dines on squashed rodents and pieces of horse; Feyd, lovely gay shiv artist; and their corps of retainers – many with eyes and ears sewn up to ensure secrecy, all fitted with easily removable heart-plugs which fountain blood when pulled out.

Raffaella de Laurentiis, daughter of the famous Dino, produced the film.

The Guild Navigators, in their black plastic macs with their brooms, tubes from nose to skull, mis-shapen brains bulging from their craniums, on their way to becoming the tanked tadpole-like foetus creatures that control all Man's travel through space.

The incredible feeling of age and permanence about much of the set, the gloomy, foreign feel to much of the photography. All of these, and more, impress, entertain, amuse, and occasionally awe.

But there are other parts of the film that just do not come off.

The plot can easily befuddle or bemuse those who haven't read the book or aren't prepared to simply sit back and enjoy. Some parts of it are too simplistic, others far too complicated for easy digestion.

The intrusive voice-overs, internal voices which are an integral part of the Dune books, are simply irritating as a screen device.

The script suffers from the attempt to keep Frank Herbert's original plot intact – especially since parts of the film removed in the cutting room often also take with them motivation or vital story information.

The Fremen desert sequences, which in the book act to bring home both the ecological side of the Fremen existance, (conserving water, worshipping the worms as both devil and god), and also make credible the changes in Paul and Jessica here seems to have become yet another 'exiled good guy teaches primative people how to master super-weapon out in the desert and two years later. . .' – simplistic in the extreme.

The film's end has been cut to ribbons; the film sometimes drags; the dialogue is often so bad it gets laughs – uneasy laughs – from a sceptical audience. Perhaps the film is too straight-faced, since wherever it has humour (as in the splattery sequences of the ghastly Harkonnens) it comes to life.

Perhaps that is what comes of trying to squeeze a story into a container just too small for it – the plot becomes too complex, the characters too straightforward.

But if you haven't seen it, and you are a science fiction fan (and if you aren't you really shouldn't be reading *Space Voyager*. Check out *Horse and Hound* or *Practical Gardening* instead), *Dune* is a must.

The Press Conference

They came in one by one, David Lynch (Director), Rafaella de Laurentiis (Producer and daughter of the famous Dino), Francesca Annis (Lady Jessica), Sian Phillips (Reverend Mother Helen Mohiam), Kyle MacLachlan (Paul Atreides), and sat themselves down on a dais in front of the press corps. They all seemed cheerful and unruffled, despite most of them having just flown in from another premiere. Rafaella was younger than I had expected a pretty, blonde Italian in her early twenties; Kyle MacLachlan had lost the severe haircut of the film and looked more human, less like a clean-thinking tailor's dummy – I'd never have recognised him; David Lynch was in his late thirties, rumpled and laid-back; Sian Phillips and Francesca Annis – as befitted the British contingent – were poised, beautiful and nearly regal.

The questioners started with Francesca Annis. Does she like science fiction? What did she think of her part?

'I don't like science fiction, although I *do* want to read the rest of the *Dune* books. But my first thought when I saw the script was just that it was a wonderful script and a great part. (To be honest, there was more in the original script for me than you see on the screen). The marvellous thing was the changes the character goes through in the story – it was a part with a beginning, a middle and an end.'

Wasn't she a bit young to be playing the mother of a twenty-four year old son? She

hesitated, then giggled. 'That's due to something called the Spice Melange. It doesn't come out in the film too much, but in the book the Spice is also an anti-ageing drug.'

Next journalist. 'I know,' she began, 'that Mr MacLachlan has read the book every year since he was thirteen. . .' (She was quoting the press handout. 'That's a bit of an exaggeration, actually,' confessed Kyle), '. . .but coming cold to the film as I did I found it virtually incomprehensible! Has a lot been cut out of the original script?'

Sian Phillips answered. 'I read the book and the script and honestly I found the script easier to understand than the book. . .but to be honest I did something I've only done twice in my career, and that was to accept the part without first reading the script – on the basis that I've known Rafaella since she was a girl. . .'

Francesca Annis: 'I didn't find the script confusing, but then again, after a year of it I'd have to be a bit dumb if I didn't understand it by now. On seeing the film I have to take other people's words for it that they find it confusing. And of course things *have* been cut out from the original script. But quite frankly I think the important thing is whether or not people find it *boring*. I've been with people who came out of the film going 'OH WOW!' and you say to them 'Did you understand it?' and they say (awed voice) 'Oh *no*.' – But I really want to read the book and I really want to see it again! 'I think the really remarkable thing about the film is that it doesn't relate to the Sixties culture in the way that the book does.'

David Lynch chipped in to point out that the book had sold over a quarter of a million copies in the US during the two weeks the film had been on release over there.

More questions. Did the women object to having their heads shaved? (Actually, they explained, it was just a make-up job, although Francesca had lost her eyebrows in an exploding gas oven accident during production). Was it uncomfortable, out in the desert, in those costumes? (Not unpredictably, yes, it was).

Most of the questions seemed rather trivial, so I chipped in a couple of my own. Did David Lynch, as director and scriptwriter, feel the film was a success? 'You bet I do!' Did Rafaella expect the film to make its money back? After all, it is one of the most expensive films ever made.

'Actually, I do. And I think it'll do it a lot more easily than a lot of people seem to think.'

There *had* been a lot of rumours about it being a commercial flop. . .

'No. It won't flop. It's too original. It doesn't look like anything that's been on the screen before. I think it's going to become a big cult movie.'

The Bene Gesserits. From left, Reverend Mother Gaius Helen Mohiam (Sian Phillips), Lady Jessica (Francesca Annis) and Reverend Mother Ramallo (Silvano Mangano).

Another journalist commented that the look of the film was very Italian. Was that Rafaella's influence? She smiled, shook her head, and pointed at the director. 'If it looks Italian it's his fault – not mine!' 'Actually the look of the thing was influenced by Italy,' Lynch explained. 'We had some script conferences there, and I was taken around Venice for the first time. And in the book there's a very. . .*old* feeling, even though it's set in the future. And that was the feeling I had in Venice, so I used that in the film.'

Sting's part was fairly small. Had it been cut a lot? somebody wanted to know.

'Pretty much all of it is there.' David Lynch began. (Rafaella interupted, 'There *are* some English cuts. . .') Lynch again, 'There's one scene with the Beast Rabban in a bathtub, where he stands up and smashes one of those floating lights overhead and it rains down a black fluid on him. It was a beautiful scene, but those beautiful scenes sometimes stop the movie, so they have to go. But the scenes that were cut weren't cut because the film had to be a certain length but because they aided the balance of the film.'

'Yeah, but the British censors cut some scenes,' Rafaella told him. 'There's one shot of Sting at the end with a knife through his open mouth – and there's the scene where the heart-stopper is pulled out by the Baron.'

Feyd-Rautha and Paul Atreides, watched by the Fremen, circle each other warily at the start of their death fight. **Photos: Universal City Studios Inc.**

Me again. Did David Lynch have a lot of trouble condensing an eight-hundred page book into a two hour screenplay?

'I had nothing *but* trouble for a year and a half, doing six or seven drafts of the screenplay. I was rewriting during shooting, and then in the editing I was recutting it, trying to keep it comprehensible for people while still keeping it moving *and* remaining faithful to the spirit of the book.

'It's the trickiest, hardest thing I've ever done and maybe ever will do. But I think it's right. It's true to the book, and that's what we set out to do.'

There was much more. We learned that all the stars had been contracted for *Dune Messiah,* the sequel – and that David and Rafaella wanted to make another movie each before starting work on it. That the other five Dune books had been optioned. That Frank Herbert had liked the design of the Guild Navigator so much he had requested some stills of it be sent to him as research while he wrote the seventh *Dune* book. That Kyle MacLachlan wasn't expecting to be recognised as a star, but that when going through Italian customs that morning one customs officer had said to another 'Don't search him – he's the guy with the giant worms!' That the sets David Lynch had built for the film were so complete and detailed it was like being in another world in fact rather than in fiction. . .

After the press conference proper was over, the principals mingled, and I stopped to talk to David Lynch, in company with The Editor of *Space Voyager* Herself. He admitted that *Dune Messiah* was his favourite of the books (mine too, I told him) and the one he was most looking forward to filming.

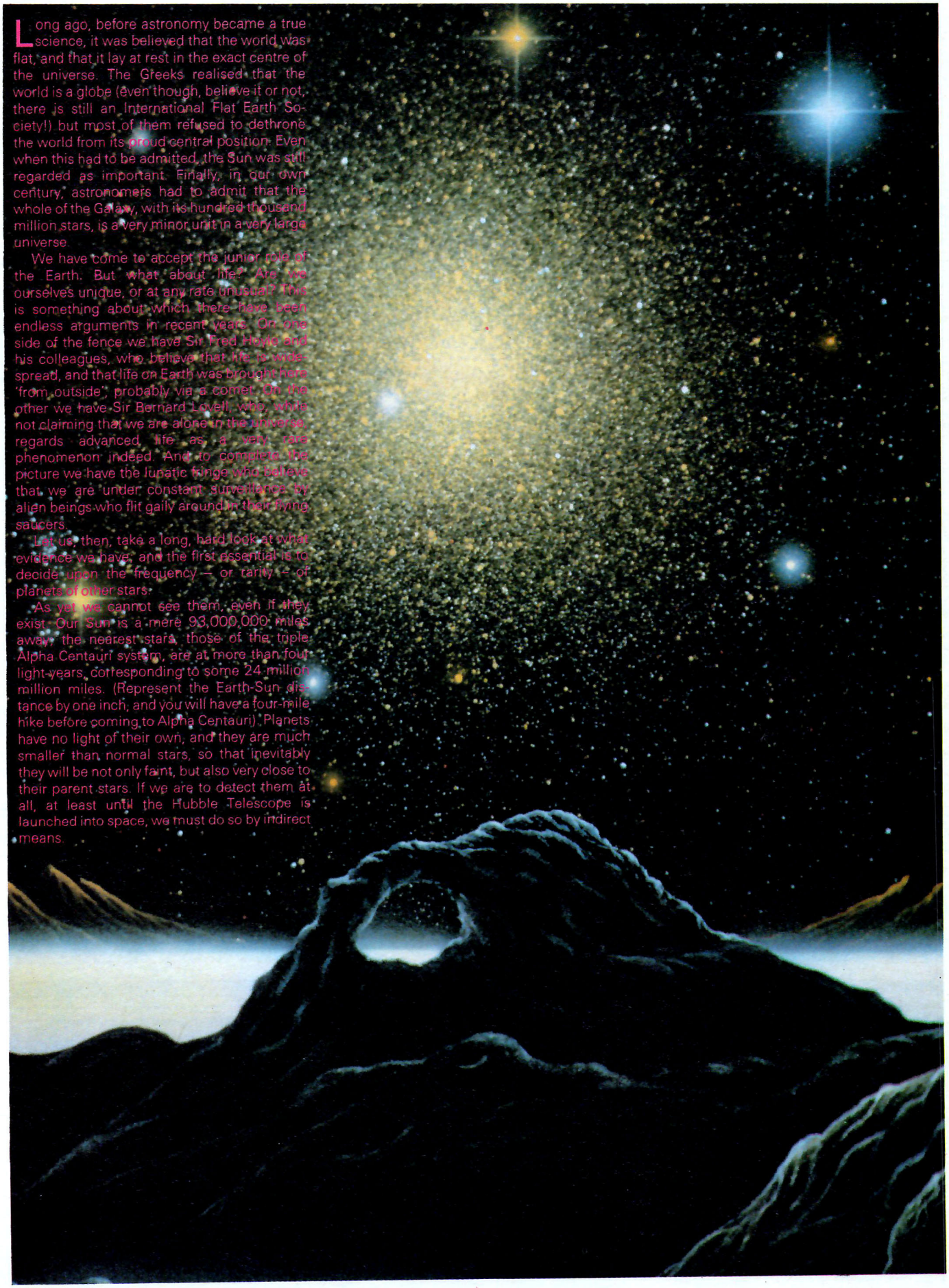
And the Editor got to ask him the question she'd been muttering to herself ever since she had seen the movie that morning.

'If it's so far in the future,' she asked, 'why haven't they invented the lightbulb? It was so *dark!*'

For the first time in the Press Conference, David Lynch seemed lost for words.

OTHER EARTHS OTHER BEINGS?

FOR SOME TIME, SCIENTISTS TENDED TO DISMISS SF WRITERS' CLAIMS THAT THERE WERE PLENTY OF PLANETS LIKE EARTH CIRCLING OTHER STARS. NOW IT LOOKS AS THOUGH PLANETS ARE THE RULE RATHER THAN THE EXCEPTION. PATRICK MOORE GUIDES US THROUGH THE LATEST DISCOVERIES WHICH COULD LEAD TO SOME INTERESTING INTERVIEWS FOR *SPACE VOYAGER* IN THE FUTURE...



Long ago, before astronomy became a true science, it was believed that the world was flat, and that it lay at rest in the exact centre of the universe. The Greeks realised that the world is a globe (even though, believe it or not, there is still an International Flat Earth Society!) but most of them refused to dethrone the world from its proud central position. Even when this had to be admitted, the Sun was still regarded as important. Finally, in our own century, astronomers had to admit that the whole of the Galaxy, with its hundred thousand million stars, is a very minor unit in a very large universe.

We have come to accept the junior role of the Earth. But what about life? Are we ourselves unique, or at any rate unusual? This is something about which there have been endless arguments in recent years. On one side of the fence we have Sir Fred Hoyle and his colleagues, who believe that life is widespread, and that life on Earth was brought here 'from outside', probably via a comet. On the other we have Sir Bernard Lovell, who, while not claiming that we are alone in the universe, regards advanced life as a very rare phenomenon indeed. And to complete the picture we have the lunatic fringe who believe that we are under constant surveillance by alien beings who flit gaily around in their flying saucers.

Let us, then, take a long, hard look at what evidence we have, and the first essential is to decide upon the frequency – or rarity – of planets of other stars.

As yet we cannot see them, even if they exist. Our Sun is a mere 93,000,000 miles away; the nearest stars, those of the triple Alpha Centauri system, are at more than four light-years, corresponding to some 24 million million miles. (Represent the Earth-Sun distance by one inch, and you will have a four-mile hike before coming to Alpha Centauri.) Planets have no light of their own, and they are much smaller than normal stars, so that inevitably they will be not only faint, but also very close to their parent stars. If we are to detect them at all, at least until the Hubble Telescope is launched into space, we must do so by indirect means.

The first method is that of measuring the proper motions of near-by stars. The individual movements of the stars are very small, but they are easy enough to track with the aid of modern equipment, and the holder of the 'speed record', Barnard's Star, takes no more than 180 years to cover a distance equal to the apparent diameter of the full moon. It is a dim red dwarf, and at its distance of six light-years it is closer than any other star apart from the Alpha Centauri group.

Weaving around

At the Sproule Observatory in America, Peter van de Kamp and his colleagues have been keeping watch on Barnard's Star for many years now. They find that it is not moving steadily; it is weaving its way along, and from this they deduce that it is being perturbed by some body which we cannot see. This body is not massive enough to be a star, and so, says van de Kamp, it is probably a planet. In fact, he tends to believe that there are at least two planets in the system of Barnard's Star, each comparable in mass with our Jupiter.

Doubts have been cast upon this claim, but it does seem to be based upon sound observation. If the planets are really there, they must be chill, gloomy places, since by cosmical standards Barnard's Star is a glow-worm and can send out little warmth to members of its system. Moreover, the planets believed in by van de Kamp are massive by terrestrial standards, and it is difficult to believe that they could support life of our type, though of course one can never be sure.

Barnard's Star is not unique, and van de Kamp and his team have suspected similar effects in other close stars, notably Epsilon Eridani, which is 11 light-years away and is more powerful than Barnard's Star even though it is cooler, redder and feebler than the Sun. But the whole method is confined to detecting relatively massive planets attending relatively near, lightweight stars, and although it is much better than nothing it cannot be regarded as at all conclusive. We must look further afield.

IRAS Breakthrough

The first breakthrough came in 1983, with the brilliant career of IRAS, the Infra-Red Astronomical Satellite. It was launched in January of that year, and operated for months before its power failed. It was responsible for a whole stream of important discoveries. It mapped thousands of new infra-red sources in all parts of the sky; it found several comets, plus a dust-tail of a known periodical comet, Tempel 2; it detected an extraordinary asteroid, 1983 TB, which passes within 9,000,000 miles of the Sun, and it also located some curious 'dustings' in the Solar System which had been previously unsuspected. The data were received at the Rutherford-Appleton Laboratory in England, and it was here that two American members of the team, Doctors Hartmut (George) Aumann and Fred Gillett were working when they had a real shock.

They were using various stars for calibrating the infra-red telescope on IRAS when Dr Gillett said, suddenly: 'Hey, Alpha Lyrae has a huge excess!' Vega, or Alpha Lyrae, is one of the brightest stars in the sky, and is almost overhead from England during summer evenings, so that it cannot be overlooked – particularly as it is much the bluest of the brilliant stars. But the discovery of infra-red excess was quite unexpected, particularly as other calibration stars, such as Altair in Aquila (the Eagle) showed no trace of anything similar.

What could it be? Aumann and Gillett were intrigued, and made a series of tests. Before long they were satisfied that the infra-red radiation really did come from the region of Vega. The source was about 20 seconds of arc in diameter, and further studies showed that it came from an area extending out to about 7,400,000 miles from the star. This is about eighty times the distance between the Earth and the Sun, so that clearly the amount of material involved was considerable. 'I started to think about it,' Dr Aumann told me. 'If there are small particles around Vega, there must be large particles also. Very careful analyses have been made of what are called fragmentation products. When I applied these methods in the case of Vega, I was astonished, because it seemed that the total mass was much the same as that of all the planets in our Solar System combined.'

'Barnard's Star has at least two planets, each comparable in mass to Jupiter.'

Chance of planets

It was then found that the material probably contained lumps much larger than mere grains of dust; very small particles would already have been drawn back into the star. In fact, there was at least a chance of bodies of planetary size; and the temperature of the material was reckoned to be about −300 degrees Fahrenheit, much the same as the temperature of the icy particles making up the rings of Saturn.

Vega, of course, is hotter and more luminous than the Sun; it could match 50 Suns combined. It is also younger, since energetic stars evolve more quickly than dimmer ones. Presumably, then, any planets would also be younger than the Earth, and could hardly have existed for long enough for advanced life to develop upon them, though again it is impossible to be sure. At any rate, the discovery was of immense significance, and the next step was to see whether any other stars had similar infra-red excesses.

Before long another was found: Fomalhaut, in the constellation of the Southern Fish. It is never well seen from England, because it is always low over the horizon, and from North Scotland it barely rises at all, but it is quite bright, and is 13 times as luminous as the Sun; its diameter is around 1,700,000 miles, as against 865,000 miles for the Sun. As the investigations went on, more and more stars were found to be similarly accompanied. By the time that IRAS finally came to the end of its active lifetime, some forty stars had been detected in the same manner, some of which were not very unlike the Sun.

Now, it seems fairly certain that the planets in our Solar System were born from a 'solar nebula', a cloud of material associated with the youthful Sun. If the Sun had been under observation from afar during this period, around 4,700 million years ago, the effects would have been much the same as those found with Vega, Fomalhaut and the rest. There is nothing exceptional about the Sun; what can happen to it can presumably happen to other stars also, and the inference is fairly obvious. Meanwhile, we have the even more remarkable case of Beta Pictoris.

Optical discovery

I am afraid that you will not see Beta Pictoris from England; it lies in the southern constellation of the Painter, and never rises above our horizon. It is of magnitude 3.8, so that it is an easy naked-eye object to South Africans and Australians; it is about 40 times as powerful as the Sun, and considerably hotter. At its distance of 78 light-years, it is much further away than either Fomalhaut or Vega.

Observers at the Las Campanas Observatory in Chile, using the powerful reflector there, have detected associated material not only in infra-red, but also at optical wavelengths. Though it is hopelessly premature to claim that this indicates a planetary system, the possibilities are there.

All in all, the evidence seems to be piling up. It is by no means conclusive, but there is nothing unreasonable in assuming the existence of extra-solar planets; it would be much more curious if they did not exist. When we come to consider the chances of advanced life, however, we are on much less safe ground.

Clearly we must start near home, and see what are the prospects in the planets of our Solar System. They do not appear to be bright, because the other members of the system are unsuitable in various ways. The Moon and Mercury are virtually devoid of atmosphere, and so are the satellites of the giant planets apart from Titan in Saturn's system and possibly Triton in Neptune's – and even here the temperatures are intolerably low. The giants themselves are gaseous at their surfaces and liquid inside. Venus is as hostile as it could possibly be; the ground temperature is at least 900 degrees Fahrenheit, the atmosphere is composed chiefly of carbon dioxide, and the clouds contain sulphuric acid. This leaves us with Mars. Here, alas, the carbon-dioxide atmosphere is very thin indeed; the climate is forbidding, and the Viking missions have shown no trace of life either past or present. (Recently there have been suggestions that one strangely-patterned rock has been carved into the semblance of a human face, either by the 'Martians' or by casual visitors in flying saucers. Sadly, I fear that the supporters of this idea must be classed with the Flat Earthers!)

'All in all, the evidence for extra-solar planets is piling up.'

Carbon: Yes. Silicon: Maybe

'But,' I can hear you saying, 'why should not alien life-forms exist which are able to manage quite happily in an airless world at sub-zero temperatures?' This sounds attractive, but it is an argument with many flaws in it. Though we do not really understand 'life', we have a great deal of information about living matter, which seems to depend upon one particular type of atom – that of carbon, which alone is able to build up the complicated molecules needed. (Silicon can make some sort of attempt at the same thing, but not very efficiently). We are

confident that we have found all the atoms which occur in Nature, and so it follows that life, wherever it may be, must be built upon our pattern. It need not look like *Homo Sapiens,* but we must remember that there is not much outward similarity between a man and an earwig, even though both are carbon-based and both need a suitable environment – that is to say an equable temperature, a supply of water, and an atmosphere rich in oxygen.

If totally alien life-forms exist, then almost everything in our modern science is wrong. Faced with an admittedly incomplete set of facts, all one can do is to take what facts there are and interpret them as reasonably as possible. All we have discovered leads us to the conclusion that complete alien life does not exist on Mars or anywhere else; and unless any contrary evidence comes to hand, I for one will continue to be highly sceptical about what we usually call BEMs or Bug-Eyed Monsters.

We must look, then, for planets like the Earth moving round stars like the Sun. There is absolutely no reason why they should not exist, and every reason why they should. Consider the southern star Delta Pavonis, which is 19 light-years away and is almost a carbon copy of our Sun. Does it have a planet about the size and mass of the Earth, moving round it at about a distance of 93,000,000 miles? I do not know; but I would not rule it out – and if conditions there are the same as they are here, then I would tend to expect the same kind of life.

Some stars are unsuitable as potential planetary centres, at least so far as life-bearing worlds are concerned. Among these are the variable stars, which swell and shrink, changing in luminosity as they do so; exceptionally powerful stars, which are short-lived by cosmical standards; and some types of binary or multiple systems. Yet solar-type stars are among the commonest in our Galaxy, and no doubt in other galaxies also, so that we have plenty from which to choose.

'Delta Pavonis, 19 light years away, is a copy of our Sun. Does it have a planet identical to Earth?'

Other life forms

It is interesting to speculate as to what would happen upon a planet which is different from Earth, but not different enough to preclude carbon-based life. There may be planets whose surfaces are covered mainly by ocean; would we have intelligent sea-life? What about a planet where the force of gravity is much greater or much less than it is here; would the beings be more massive, or tall and spindly? The possibilities are almost endless.

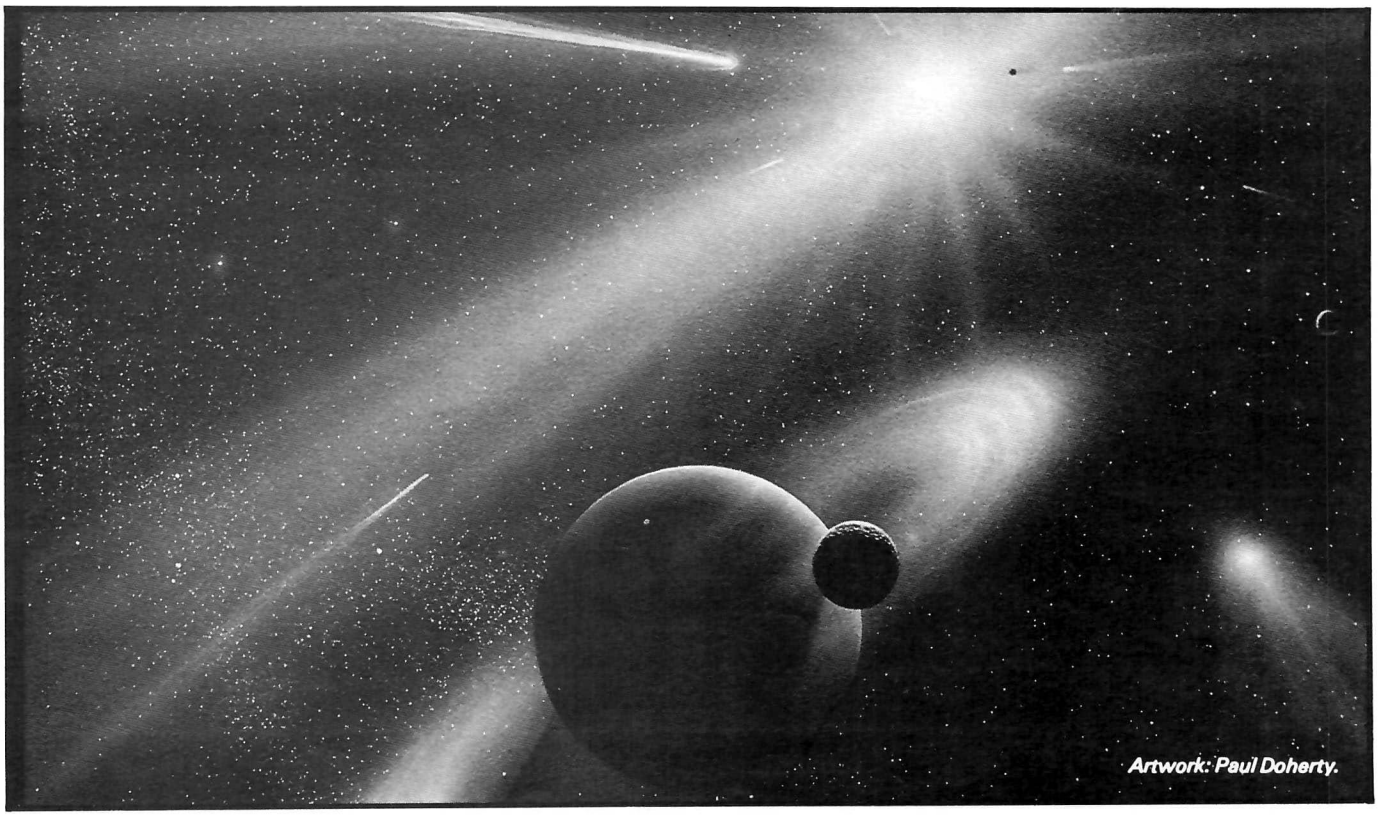
The main trouble, of course, is that obtaining proof – or disproof – is going to be very tricky. We certainly cannot hope to find out by dispatching rockets. Our modern probes are adequate for the Solar System; Voyager 2, launched in 1977, will by-pass the outermost planet, Neptune, in 1989. But to reach even Alpha Centauri in such a way would take centuries, and I personally have no faith in the current science-fiction solutions, such as putting the crew into deep freeze and re-activating them only when they are homing in to their target. No; if we are to achieve interstellar travel, I feel that it must be by some method about which we know nothing as yet, so that we cannot even speculate rationally. When we talk about space-warps, time-warps, thought-travel and teleportation we are leaving pure science and entering the realms of Dr Who and Lord Darth Vader. I am not claiming that interstellar travel is impossible. All I am saying is that it is impossible by any method known to us at present, which is by no means the same thing. We may be no further from, say teleportation than King Canute was from television.

E T Phone Patrick

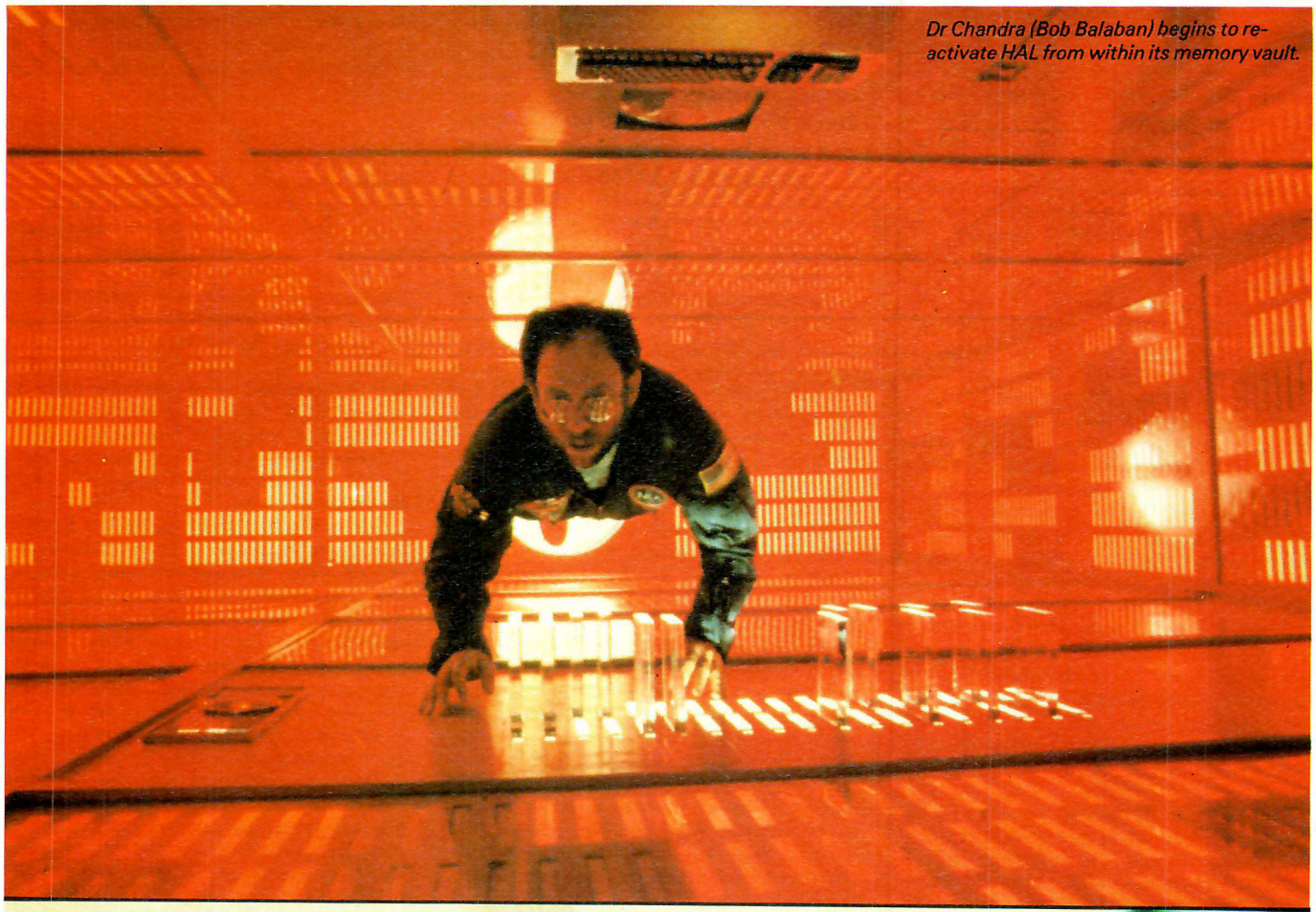
There is one more point which is a particular hobby-horse of mine. It has been claimed that we are unwise in making our presence known, even by radio or by putting plaques in non-returning probes such as the Voyagers, because it might lead to an invasion of Earth by extraterrestrial beings who are intent upon taking us over. To me this seems to be utter nonsense. Any civilisation advanced enough to have mastered the art of interstellar travel will have left us far behind, and will certainly have banished all thought of war and conquest. Otherwise they would have destroyed themselves, as indeed we are in danger of doing at the present moment.

I suppose that the only current hope of proving the existence of other civilisations is to pick up radio messages from them. Even this would be limited, because to send a signal to the nearest reasonably solar-type star and receive a reply would involve a total delay of over twenty years; but at least it is not out of the question, and various experiments in this direction have already been made. It is the longest of long shots, but if we do not try we can have absolutely no hope of success.

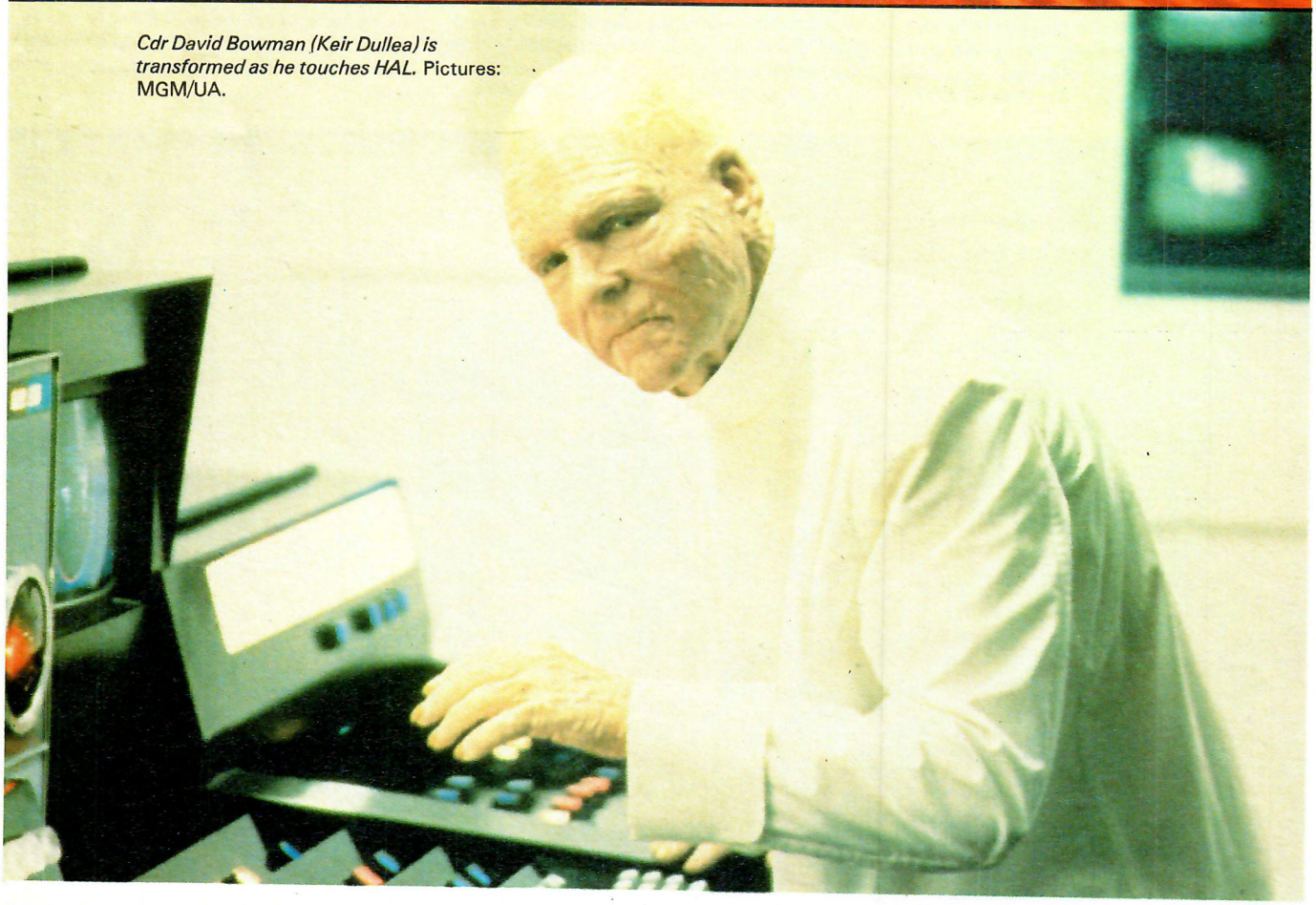
Otherwise we must wait for the great breakthrough, which may come next year, in a hundred years, a thousand years, a million years – or never. I will only say that if a spaceship from another system does land here and make itself known, I hope that the crew will make haste to contact me. There is nothing I would like better than to interview a denizen of Epsilon Eridani C on my *Sky at Night* programme!



Artwork: Paul Doherty.



Dr Chandra (Bob Balaban) begins to re-activate HAL from within its memory vault.



Cdr David Bowman (Keir Dullea) is transformed as he touches HAL. Pictures: MGM/UA.

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2010: A NEW ODYSSEY

FOR MOST PEOPLE *2001* IS ONE OF THE GREAT SF FILMS. IT WOULD BE FAIR TO SAY, THEREFORE, THAT THE FILM OF ARTHUR C CLARKE'S, *2010,* HAS BEEN EAGERLY AWAITED. DUE OUT, HOPEFULLY, IN BRITAIN AT THE END OF THE MONTH, HERE JAMES BURNS GIVES US A PREVIEW.

'By being a film about our world and our ability to live in peace, *2010*'s underlying theme is, basically, one of hope,' says Peter Hyams, director of the upcoming SF spectacle. 'It's a very accessible story. At the same time, though, the film contains extraordinary concepts that take us a quantum leap forward.'

2010 is, of course, MGM's sequel to their earlier *2001: A Space Odyssey,* one of the most lauded science fiction films of all time. Released in 1968, *2001* was made by director/producer Stanley Kubrick and renowned science fact and fiction author Author C Clarke who collaborated on the screenplay.

In MGM's new film, which takes up the story several years after the Discovery's doomed voyage, Earth's space agencies are thoroughly baffled. The excavation of the monolith had been the most amazing event in recorded history. After thousands of years of speculation, man had evidence that he wasn't alone in the universe. But the monolith's existence also prompted a fresh line of inquiry: What did the artifact signify? Was it an intergalactic tool, a warning, or simply a monument? And what, in fact, of the slab's creators? Were they even still alive?

Despite the efforts of science's finest minds, as represented by the Discovery mission, man is still no closer to perceiving the truth. All the agencies known of the Discovery's fate is what occurred prior to the moment Bowman entered the star-gate.

To attempt to solve the mysteries a joint Soviet-American mission is dispatched to Jupiter, aboard the Leonov, since the abandoned Discovery and the monolith are still adrift near the planet. By carefully exploring both, the Leonov's crew hopes to discover not only the nature of the enigmatic black slab (and what it did to Bowman), but of the superior race that left it behind.

Ironically, it's the ship's arrival itself that triggers the monolith to enact a portion of its real purpose: a revelation that could permanently alter man's cosmic stance.

'The resulting finale,' Hyams comments, 'is something that only Arthur Clarke could have thought of. It will help clear up a lot of the mystery about the first film.'

While what transpires is not a re-enactment of Bowman's 'ultimate trip,' MGM promises that *2010*'s climax 'is at least as intriguing' as the original film's denouement.

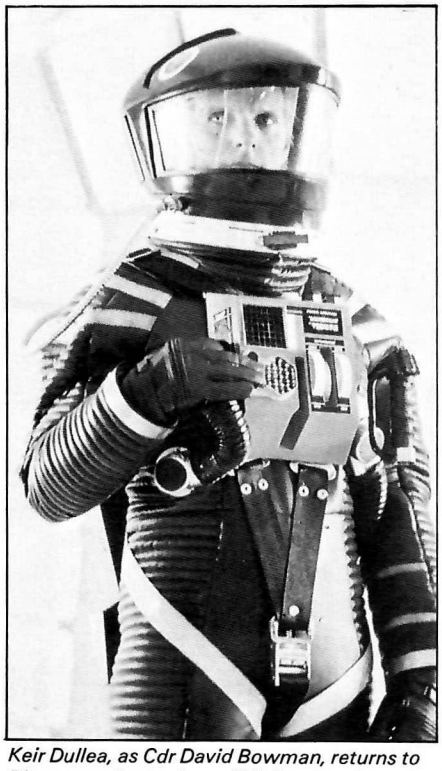
Pen to Production

2010's origins date back a few years to when Arthur C Clarke exercised his contractual right to pen a novelised *2001* sequel. When the book became an immediate bestseller upon its early 1982 release, MGM was quickly motivated to spare no expense in adapting it to celluloid...

'2010 is the most ambitious project the company has put before the cameras in recent years,' confirms Freddie Fields, MGM's studio-head at the time of the picture's start. 'I'm certain that it's going to be the new film season's biggest and best entertainment.'

Following a lengthy pre-production period, *2010* started filming on February 6, last year. Most of the pictures was shot at MGM's Culver City, California complex, utilising two massive soundstages (numbers 15 and 30). There was a week of location work, in Washington, DC, a West Coast computer computer facility, and an antenna array in New Mexico. Special effects were supervised by Richard Edlunds (fresh from seven years with George Lucas).

'Any time I've done a picture, I've tried to get everything I possibly could on the screen,' says Peter Hyams. 'In this case, we've really benefited by the tremendous explosion in technical wizardry that's followed in *2001*'s wake. Unlike other recent space films, however, *2010* isn't a fantasy. What's so striking about Arthur Clarke's writing is that it's feasible: it can happen. Everything that we've done on *2010,* in terms of effects and sets, is an attempt to try to convince you that what you are seeing is, in fact, real. Thanks to an incredible team of artists, conceptualists, and technicians, no suspension of belief will be necessary to enjoy *2010.*'



Keir Dullea, as Cdr David Bowman, returns to Discovery after an incredible journey through time and space.

Foremost on the agenda for Hyam's team – including production designer Albert Brenner (*The Goodbye Girl, The Turning Point*) and futurist Syd Mead (*Blade Runner, Tron*) – was duplicating the Discovery, as well as ensuring that *2010*'s new sets and costumes maintained a stylistic semblance to those seen in the first film.

Cast returns

Easing the picture's attempted recreation of *2001*'s milieu is the return of actor Douglas Rain, again supplying the voice of HAL, the computer. The picture's most remarkable reprise, however, belongs to Keir Dullea, as David Bowman.

'There was a special feeling on *2010*'s set,' Dullea recently said on American television, 'partly, I suppose, because Douglas Rain and I were the link to *2001*. It was very exciting for me.'

Since *2001,* Dullea has been active on TV, stage and in such films as *Friends* and *A Kiss is Not a Kiss*. Additional science fiction productions have included *Starlost* (a short lived 1973 syndicated teleseries), *Strange New World* and *Brainwaves*.

Once in costume as Bowman, though, Dullea eerily appears as if the past several years never happened, almost as if he had walked off Kubrick's set directly onto Hyam's. In *2010,* Bowman has become a cosmic apparition: mentally, if not physically, alive. When Bowman makes himself visible to a Leonov crewmember, he seems 'something far more than human, but something less as well.' (He also, at times, pops back and forth between his 'normal' guise and his 'old-man' visage from *2001*'s ending).

Dullea comments, 'Towards the end of the movie, without giving anything away, really, I am a totally disembodied being. At that point, HAL and Bowman have a conversation: two

voices just echoing through the emptiness of the old ship. What was interesting about the shooting of that sequence was that Douglas Rain and I got to do our lines together, which wasn't the case on *2001'*. (Rain performed his dialogue for Kubrick, in a recording studio, in a single afternoon). 'The voice of HAL I originally worked with was the Cockney-accented one of the assistant cameraman!'

2010 more human

MGM's various casting and production efforts to, as Freddie Fields puts it, 'preserve the integrity of *2001,'* could be misleading. *2010,* as Arthur C Clarke intended, isn't merely a rehash. Nor is it likely that MGM would have wanted it to be, even without the novel's example.

Although the majority of film-fans regard *2001* as a landmark motion picture – for both its technical virtuosity and 'serious' approach to SF – most Hollywood executives believe that the movie never scored as strongly as it should have. (According to one studio source, it wasn't until after several re-releases that *2001* finally recouped its production costs). Additionally, *2001*'s fame has been tainted by controversy, due to what some consider its 'abstract narrative.'

When peparing *2010,* MGM wanted to ensure that their sequel would be more 'thematically precise' *and* faster paced than its precursor. They also wanted the film, like the novel, to emphasise people – an element that even some proponents of *2001* felt the original movie lacked.

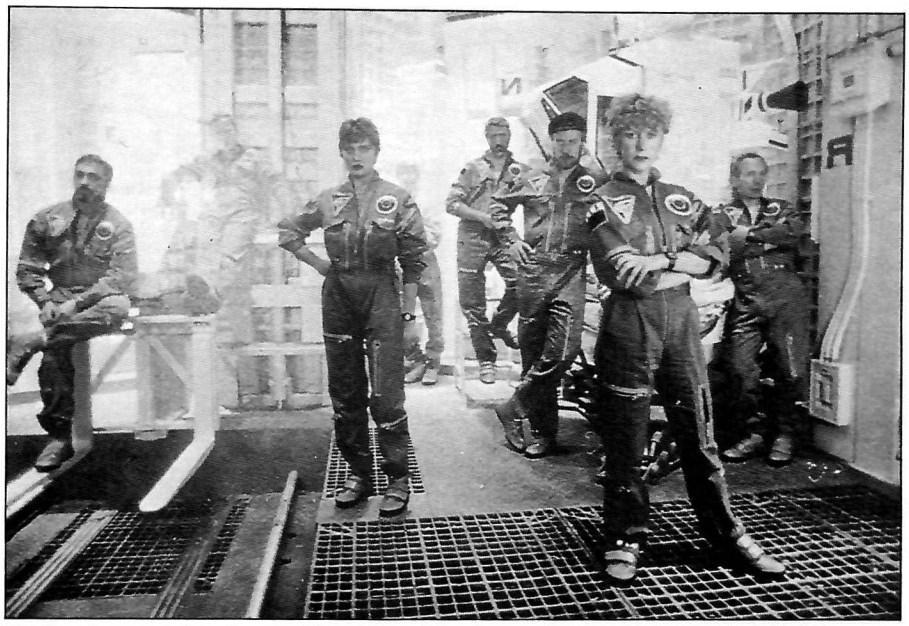
'We are telling a story of man, not machines,' says Hyams. 'Characterisation *is* the spine of this movie.'

2010's human slant mandated a hefty reliance on actors. Roy Scheider (*Blue Thunder, All That Jazz*) stars as Dr Heyward Floyd (portrayed in *2001* by William Sylvester). Floyd is now a dean of a Hawaiian university, ousted from his position as chief space administrator following the 'Discovery disaster.' His delight at taking part in the Leonov's journey is haunted by the knowledge that it was his plan, no matter how inadvertantly, that caused the initial mission's failure.

Co-starring in *2010* is John Lithgow (*Terms of Endearment, Twilight Zone – The Movie*) as Dr Walter Curnow, an engineering specialist whose task is to attempt reactivating the Discovery. Curnow has mixed emotions about being in space, 'probably preferring to be safely at home with his drafting table.'

Accompanying Curnow when he reboards the Discovery is Dr Chandra, HAL's creator, assigned to analyse what went wrong with the computer, 'by turning him back on.' Chandra's fellow passengers note that he seems to relate better to his inventions than he does to other humans – a trait that, at first, appears to be merely eccentric. His sympathy for the 'mad machine,' however, could endanger the Leonov's entire expedition. Portraying Chandra is Bob Balaban (*Altered States, Close Encounters*).

Further rounding out *2010*'s thespian lineup is British actress Helen Mirren (*The Long Good Friday, Excalibur*) as Tanya Kirbuk, the Leonov's captain. The rest of the craft's Soviet crewmembers are played by six expatriate Russian performers and a Czech, all of whom, Hyams claims, 'bring an authenticity to their roles that would not have otherwise been possible.'



The Russian crew of the Leonov. From left to right, they are Victor Steinbach as Dr Mikolai Ternovsky; Jan Triska as Dr Alexander Kovalev; Natasha Shneider as Dr Irina Yakunina; Oleg Rudnik as Dr Vasali Orlov; Vladimir Skomarovsky as Dr Yuri Svetlanov; Elya Baskin as Dr Maxim Brailovsky; Helen Mirren as Captain Tanya Kirbuk; and Savely Kramarov as Dr Vladimir Rudenko.

Big budget SF

Despite the 'average' box-office performance of *2001,* MGM's obvious expenditure of money on *2010*'s cast, as well as its other aspects, is nonetheless understandable. When *2001* premiered, science fiction was largely regarded as a 'B-movie' genre. Today, however, the success of such projects as *Star Wars, ET,* and the *Star Trek* movies have established that there's an automatic market for well-honed science fiction.

Less explicable is the studio's selection of Peter Hyams; especially since he's not only *2010*'s director, but its screenwriter, produced and cinematographer. Hyams began his career as a television news reporter (with stints as a documentarian and Vietnam correspondent), before switching to fiction with his 1970 screenplay, *T R Baskin.* Subsequently, Hyams directed TV-movies and made his feature debut with 1974's *Busting.* His only previous genre efforts have been disappointing: *Capricorn One* was an *anti*-space film, while *Outland* committed the uninspired SF boner of setting a western in outer space, without enough revisions – aside from high tech trappings – to make the story and characters appropriate to their setting.

Helen Mirren as Capt[illegible]buk.

On *2010,* though, Hyams, to his credit, seems to have understood his job.

'The prospect of following in Arthur C Clarke's and Stanley Kubrick's footsteps is absolutely terrifying,' Hyams confided. *'2001*'s a classic, a yardstick for films dealing with the future. Additionally daunting is the fact that there have been some other remarkable science fiction pictures in the past eight years. I have an enormous heritage to try to live up to.'

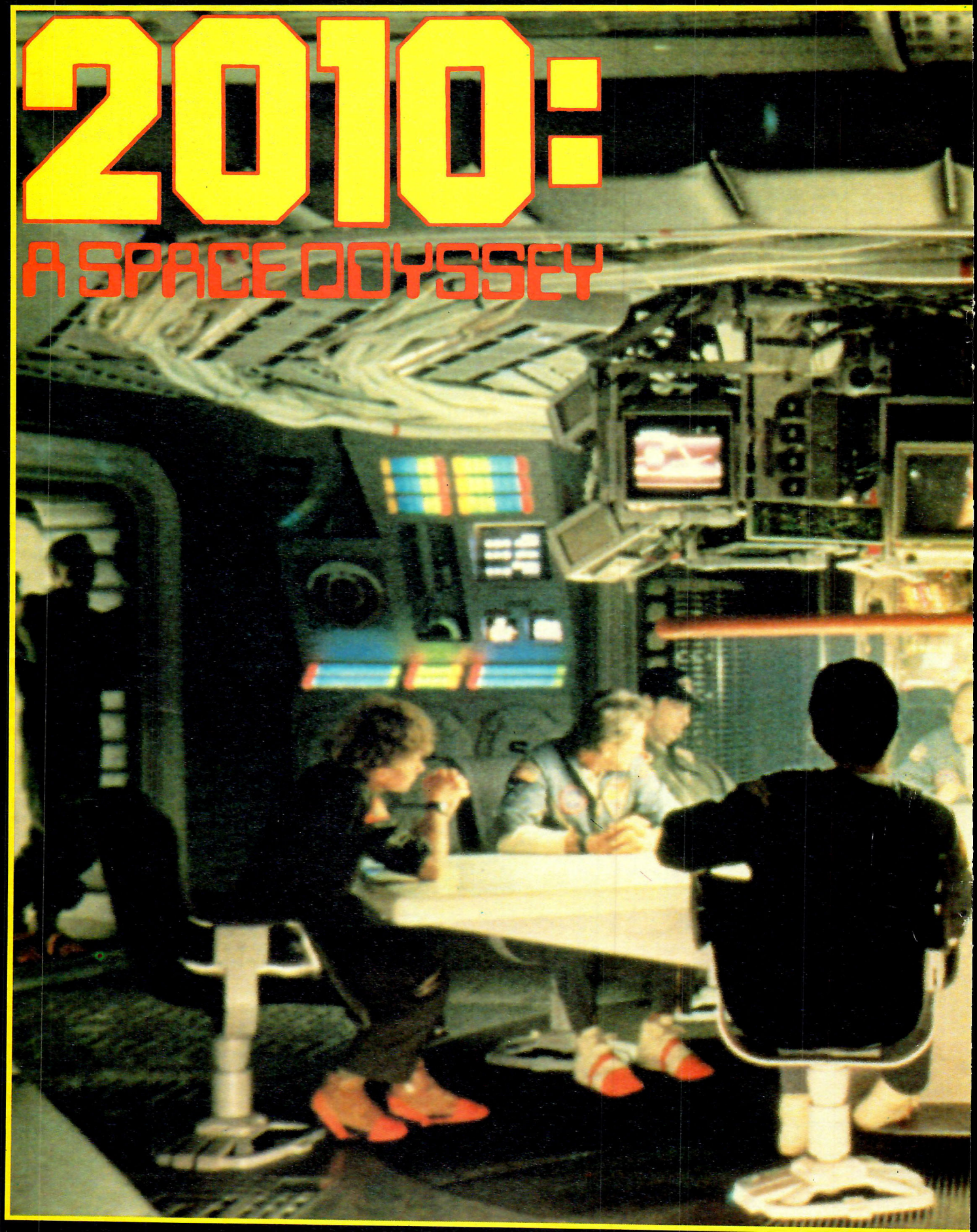
From the moment Hyams signed for *2010,* he wanted to maintain 'closer contact' with Clarke, to have his advice on story ideas and revisions. Clarke, however, lives in Sri Lanka, fourteen time zones away from Los Angeles, 'on the other side of the world.' To surpass their geographic isolation, the duo utilised a special computer-linkup that allowed them to communicate instantaneously.

'2010 is Arthur Clarke's story,' Hyams stresses. 'My job was simply to translate that tale to his satisfaction.'

If, indeed, Hyams has remained faithful to Clarke's novel, *2010* will accomplish what traditionally sequels shouldn't do: alter the way in which we view the initial movie. By explaining many of the first film's intangibles, Clarke's follow-up removes much of the original picture's mystical aura – a large part of *2001*'s overall ambience and appeal. Although *2010* raises some equally fascinating questions, they are of a more straightforward, hard-science fiction nature.

Yet, just because *2010* is different from its progenitor doesn't necessarily mean that it will be a bad film. As Arthur C Clarke points out, *'2010* is very much a self-contained story.' Hopefully, *2010*'s filmmakers have instilled their effort with the same professionalism and imagination that Kubrick and company once employed.

2010: A SPACE ODYSSEY



Russian and American scientists discuss their intrepid recovery mission in 2010.

The EARLY ANDERSON

MOST PEOPLE ARE FAMILIAR WITH THE NAME GERRY ANDERSON, MASTER OF THE SF PUPPET SERIES, BUT TO MOST READERS HIS EARLY OFFERINGS WILL BE ONLY DIM REMEMBRANCES FROM CHILDHOOD. DAVID NIGHTINGALE TWEAKS THE CHORDS OF MEMORY.

Are British TV companies finally starting to treat their past triumphs with some measure of respect and decency? Recently there have been repeats of vintage television series with the broadcasters proclaiming the care and attention they have taken to screen episodes in chronological order. ITC Entertainment having provided, according to some sources, episodes of *The Prisoner* and *Danger Man* in the wrong order have been asking help from Gerry Anderson fans to find the definitive screening order for their 1961 black & white *Fireball XL5* puppet series. That they sought such opinion is significant in their effort to get it right this time.

Some might say it is amazing that the ITV companies (*not* Channel 4) want to re-show these 39 classic episodes at all in home-computerised, all-electronic, 1985. With the subsequent *Captain Scarlet and the Mysterons* (1967, 32 episodes in colour) also scheduled to be seeing light of day again this year, in spite of rumour to the contrary due to the programme's undisguised on-screen violence, what further testimony is needed to the talents of the man responsible for them both? Gerry Anderson (whose *Stingray, Thunderbirds* and *Joe 90* were similarly repeated only a couple of years ago) entered the film business almost by chance and his work with puppet films was even more unforeseen. He initially wanted to become an architect, but his ambitions were frustrated when he found himself allergic to a fibrous plaster often used in the construction of film studio scenery. This tenuous link directed the young Gerry Anderson towards a film studio industry career and his big opportunity arose when he joined the British Colonial Film Unit where he worked in most departments learning the basics of film-making. It was then off to the cutting rooms at Pinewood Studios for more valuable experience before National Service and a two year stint in the RAF.

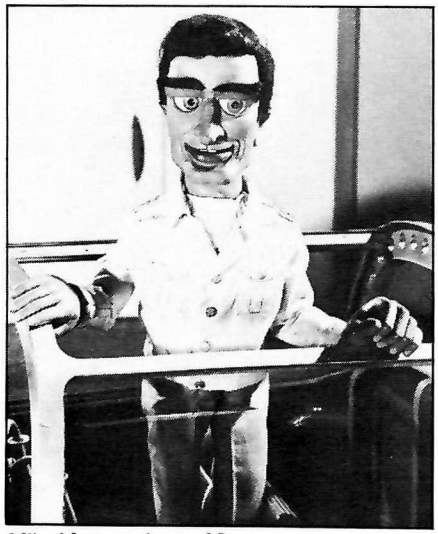
Back in Civvie Street, Anderson joined a small company called Polytechnic and directed a series *You've Never Seen This.* The title was apt. No-one ever has seen it. For it was never screened. After a few minor projects Gerry Anderson struck out with this cameraman from *You've Never Seen This,* Arthur Provis, and formed A P Films in a disused ballroom in Maidenhead. Anderson maintains, light-heartedly, that 'A P' stood for 'Anderson Pictures', whilst Provis counter-claimed it was simply his own initials!

This was 1955 and there wasn't exactly a queue of people at A P Films' door offering them work. Said Anderson, 'I sat back waiting for someone to come and want me to re-make *Ben-Hur*'. No-one came.' The situation was nearly desperate when a young novelist, Roberta Leigh, asked the company to create a television series. A deal was struck and it was only afterwards that the partners realised they were committed to a puppet production with a budget of only £450 per episode.

Twizzle

Thus was born *The Adventures of Twizzle*; 52 episodes, 15 minutes long and in black and white, were produced though now only six can be found. Fanderson (the Official Gerry Anderson Appreciation Society) purchased a print of the first episode which they screened at their 1984 Convention. It was obvious the stories were firmly lodged in the pre-school audience range and even with a room of die-hard fans it was hard to view the segment as anything other than a piece of Anderson history with limited interest.

Twizzle himself was a boy doll who had the ability to elongate his arms and legs. With Footso, a black cat with big paws, he built Stray



Mike Mercury, hero of Supercar.

Town, which became a haven for the world's unloved and maltreated toys. .characters such as Jiffy the broomstick man, Chawky the white-faced golly, and Bouncy the ball. Papier-mache Twizzle drove about in a red breakdown van and involved himself in such stories as *Footso And The Naughty Girl* and *Twizzle Papers The Cabin!*

Torchy

As dated as this series now appears it met with a measure of success and evidently was repeated right into the 1960s. Such popularity led Roberta Leigh to create a new, more memorable, character called *Torchy, the Battery Boy.* The resulting Anderson series of the same name established a hallmark of his future production – the way in which each built upon the experience of the predecessor. *Torchy* characters had movable mouths and were supported by finer strings. Twenty-six episodes were produced in 1957, again 15 minutes long and in black and white. There is a rumour that a further 26 episodes were made, not by Anderson, but unfortunately no prints of any *Torchy* episodes can be located, nor a complete episode listing.

The *Torchy* format was in some ways similar to that for *Twizzle.* Torchy was a clockwork toy with a miner's-type hat and lamp. He was sent to Topsy-Turvy land, an alien world, where he lived in Frutown with such friends as Pom Pom the toy poodle, Flopsy the rag doll, Ena the hyena, Pilliwig the clown, Sparky the baby dragon, Squish the space boy and, Pongo the pirate. King of Topsy-Turvy land was King Dithers who was esconced in his Orange Peel Palace. Many people remember Torchy's rocket ship in which he regularly came to Earth to deal with wrongdoers, particularly an obnoxious girl called Bossy Boots.

A serious merchandising effort was tied into the series (another Anderson hallmark) and you can still find the odd *Torchy* annual at jumble sales. Much rarer is the Torchy toy puppet from Pelham Puppets, who later produced similar toys from other Anderson shows.

Four Feather Falls

Gerry Anderson has always pointed to the team effort behind his productions and already established at A P Films were cameraman John Read (who would later team up with ex-Anderson puppeteer Mary Turner to produce such television puppet series as *Cloppa Castle* and *Rupert the Bear*) and Reg Hill, who would produce some of Anderson's later productions under his own name. Also involved was Sylvia Thamm, who later became Sylvia Anderson, and Barry Gray who was already a well established composer and arranger and who had worked with Roberta Leigh on the *Twizzle* and *Torchy* songs. His contribution to the third puppet show was even more fundamental for it was he who devised the format and initial characterisations for *Four Feather Falls,* a Western series.

A P Films had moved to Slough Trading Estate and better studio facilities. Granada Television financed the 52, 15-minute black and white, episodes which were a turning point technically. An electronic means of synchronising a puppet's lip movements with

the character's dialogue was developed called Lip-Sync. The voice artistes (including Nicholas Parsons as Sheriff Tex Tucker) would record their parts on audio tape much as if for a radio play. Inside the puppets' heads were tiny solenoids connected to a very soft, kid leather lower lip. When the dialogue was played back a technician would flick a key to the rhythm of the speech and tiny impulses would be sent down the puppet's support wires to activate the solenoid. This proved a passable imitation of human speech and the process has passed almost into legend when Anderson coined it 'Supermarionation'!

More money was available for full three-dimensional sets and special effects began to play an important role, master-minded latterly by Derek Meddings who would go on to work with Gerry Anderson for many years (designing, amongst others, the Thunderbird machines) before leaving to work on the James Bond movies and win an Oscar for this effects in *Superman: The Movie*.

Whilst *Four Feather Falls* was basically a straight-forward Western adventure series an element of fantasy crept in. Sherrif Tex Tucker found favour with the great Indian chief Kalamakooya when he found the latter's son wandering in the desert. Tex was rewarded with four magic feathers; one gave the power of speech to his dog, Dusty, whilst the second did the same for Rocky, his horse. The remaining two enabled Tex's two six-guns to fire by themselves, swivelling in their holsters as they did so.

Continuing characters included Grampa Twink, Ma Jones, Doc Haggerty, Marvin Jackson, Dan Morse and Slim Jim. Villains were two Mexican bandits, Pedro and Fernando, as well as Red Scalp, the renegade Indian chief. A memorable element in the series was the music with the late Michael Holliday providing the singing voice of Tex. Such ditties as *Happy Hearts and Friendly Faces* and *Two Gun Tex* proved very popular.

By now a major difficulty with the puppets became apparent: making them walk convincingly. Anderson hadn't set out to make puppet films as a career, but once he got involved he wanted to make the best of them and their awkwardness in walking was one problem he was determined to surmount. A solution emerged if a series format could be set in a technological and futuristic setting. If characters moved around in hover cars and on moving walkways, the puppets didn't need to walk at all! However, by improving his technique Anderson was slowly hanging himself by his own petard. By making superb puppet films he ensured no-one wanted anything else from him and the producer became trapped by his own success. Dreams of moving on to real actors, even feature films diminished as a result.

Supercar

The next production saw the break-through into a more science fiction environment and, for many fans, the start of Gerry Anderson productions as they know them. *Supercar* concerned a revolutionary new vehicle which could fly, hover over land, travel in space or go underwater. Developed, for no apparent reason, by Doctor Beaker and Professor Popkiss at their Black Rock, Nevada, laboratory the machine's test pilot became the hero of the show – Mike Mercury. In the first episode Bill and Jimmy Gibson crashed their aircraft and Supercar came to their aid. Young Jimmy, along with his mischievous pet monkey, Mitch, became part of the Supercar team with brother Bill making the occasional guest appearance. Eager to get his hands on Supercar for his own nefarious purposes was Masterspy, aided by his wimp of an assistant, Zarin. Vocally these two characters sounded similar to Sidney Greenstreet and Peter Lorre and Masterspy's appearance has, perhaps unkindly, been likened to that of (now) Lord Lew Grade.

Not that anyone at the studio should have had anything but reverence for the (then) head of ATV, an independent television station, as he proved their saviour. Anderson had formulated *Supercar* hot on the heels of the success *Four Feather Falls* had brought Granada Television, and naturally he thought they would immediately back his new series, which they didn't! The company nearly folded until Grade appeared on the scene. With a demand that A P Films cut the budget by half, ATV (through its ITC Entertainment division) offered to fund *Supercar*. After a well-documented night of frantic cost-cutting, Anderson was able to present a 40% cutback and Lew Grade bought the show.

It was the start of a unique partnership, one of the most fruitful the British television industry has ever seen. For the next 17 years A P Films and Lew Grade worked together, with Grade taking over Anderson's company entirely in the mid-1960s. No less than 39 episodes of *Supercar* (30 minutes each in black and white) were made and initially screened in two batches of 26 and 13 during 1959 and 1960. It was sold to over 100 American television stations and future success was assured with a merchandising operation necessitating the formation of a separate company under the control of Keith Shackleton, whose most recent clients have been the Abba music group. The studio of A P Films never stopped working from that time until the early 1970s.

Fireball XL5

Fireball XL5 charted a similar course to *Supercar* with 39 episodes (again 30 minutes long in black & white) as Gerry Anderson, having dipped his toe into the science fiction pool, plunged head first into it by setting the format firmly in the future with outer space as the backdrop. The series established yet another Anderson hallmark: the World Organisation. In this case the World Space Patrol, based at Space City under the control of Commander Zero and his aide-de-camp Lieutenant Ninety, was responsible for patrolling the space lanes and keeping intergalactic peace. Fireball XL5 led the W.S.P.'s battle against a variety of weird alien races, crazy professors and reckless robots.

Colonel Steve Zodiac captained Fireball, aided by his female Doctor of Space Medicine, Venus, and Professor Mathew Matic. The final member of the crew was a memorable transparent plastic robot called Robert. The sound of his repetitious drone 'On our way home,' lingers on. Interestingly, Robert's voice was the only part Gerry Anderson himself played on-screen. Having been impressed with a voice synthesiser whilst on a visit to Edinburgh University, Anderson used it to convert his voice into that of Robert. Loonie the Lazoon, Venus' alien pet creature which afforded a few cheap laughs and plot diversions, was Mitch the monkey's legacy from *Supercar*.

The current re-screenings will reveal whether the series has stood the test of time, but in 1961 the programme was a great success. *Fireball XL5* remains the only Gerry Anderson production to receive a full (NBC) networking in the USA. Not even the glossy and expensive *Space: 1999* could manage that!

Stingray

Spurred by this success, Lew Grade ordered a further puppet series. The 39 episodes of *Stingray,* again of 30 minutes duration, saw several important developments. Arthur Provis had left the company and shortly afterwards, with Roberta Leigh, produced a puppet series of his own called *Space Patrol* (aka *Planet Patrol* in America). In many respects this production equalled *Fireball* production values. . .at least the characters wore space-suits and didn't use the *XL5* cop-out of swallowing oxygen pills! The special effects in *Fireball XL5* had been well received and, as Derek Meddings himself said, 'Every time they came to a new series the first thing they asked for was more effects, more effects,' so new premises were required and A P Films moved deeper into the Slough Estate and acquired more modern and spacious factory units to convert into studios.

The most significant advance was that *Stingray* was filmed in colour; indeed it was the first British television series to be made in colour, an obvious aid in selling it to America where colour television was just getting under way. Even so it failed to gain a network sale.

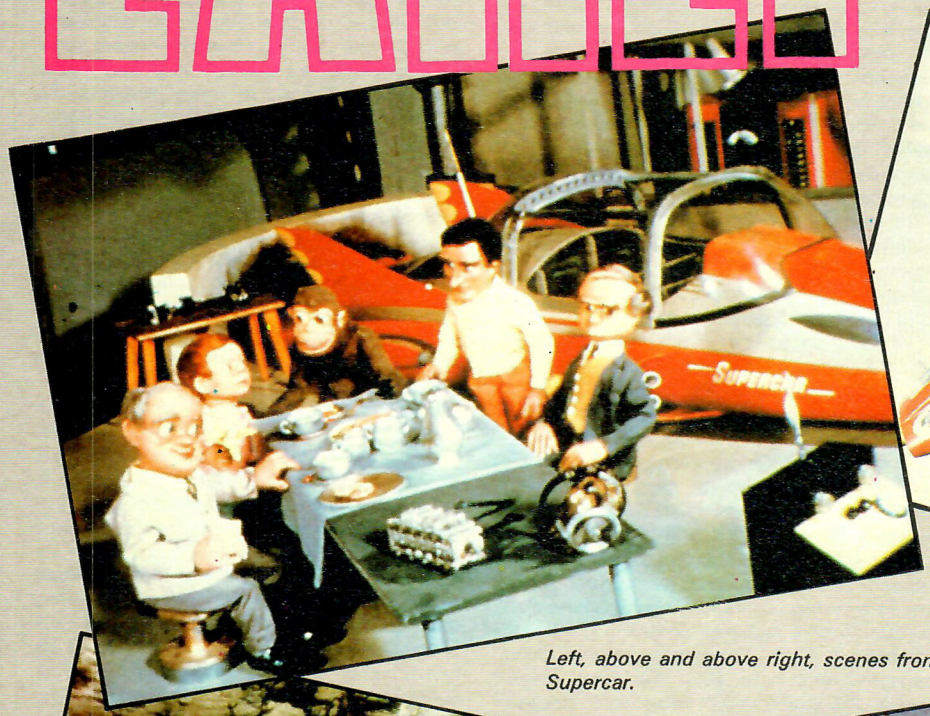
The 'organisation' featured was the World Aquanaut Security Patrol (the WASPs) and their concern was the world's oceans, not outer space. Instead of a sleek spacecraft we had a rather stunning submarine under the command of Captain Troy Tempest and Lieutenant George Lee Sheridan, otherwise known as 'Phones' after his love for radio. A third member of the crew was collected in the first episode, the undersea girl, Marina. Whilst having the advantage of being able to breath underwater, she was somewhat handicapped by being mute. The 'cute pet' idea was thankfully on the way out and Marina's pet seal, Oink, was only seen sporadically. The WASP came under the command of the, at times, irascible Commander Sam Shore whose daughter, Atlanta, provided Troy Tempest with one or two anxious moments as both she and Marina vied for his affections.

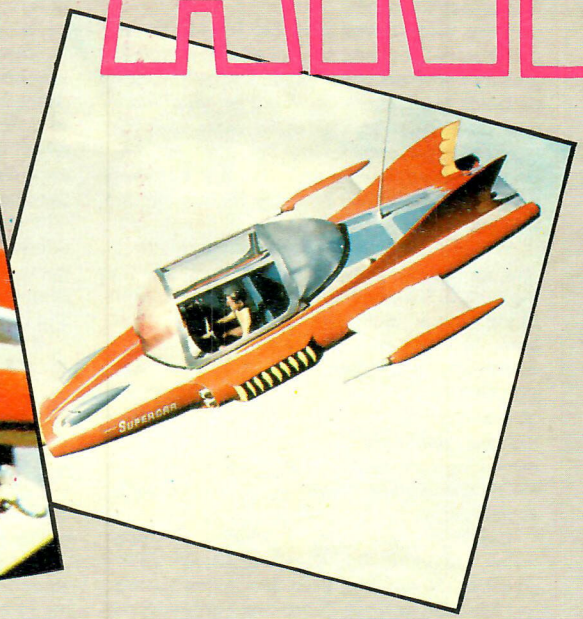
Just as Marina represented the kindly undersea races, so Titan, Lord of Titanica, exemplified the evil fish folk who strove to eliminate the WASPs in general and Stingray in particular. Titan's surface agent, X-20, and his army of aquaphibians (who spoke with a distinctive gurgling sound) provided moments of comic relief but, in the main, they were a pretty bad bunch. At least they didn't turn up week after consecutive week like a certain gang of alien foes in Anderson's latest puppet offering, *Terrahawks*.

Stingray was the beginning of Gerry Anderson's heyday. The tone had been set . . . plenty of action, good special effects featuring amazing futuristic craft, stirring music and exciting plot. The time was ripe for the next production.

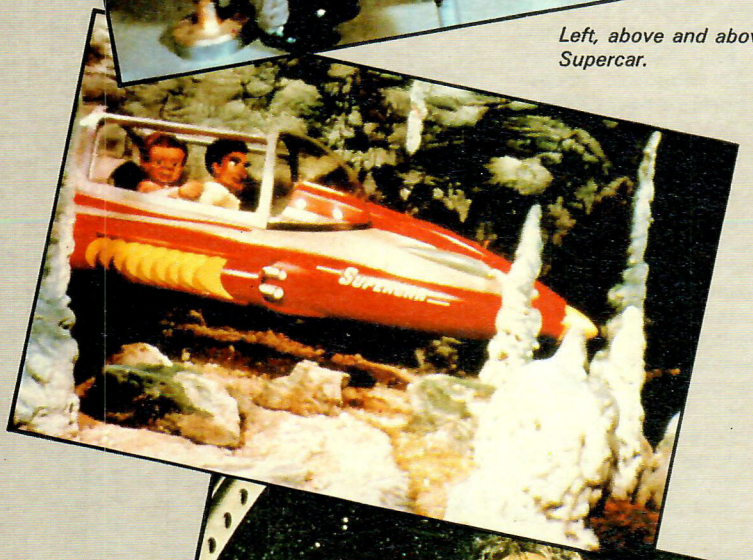
Captain Scarlet and *Thunderbirds* were very nearly Go . . .

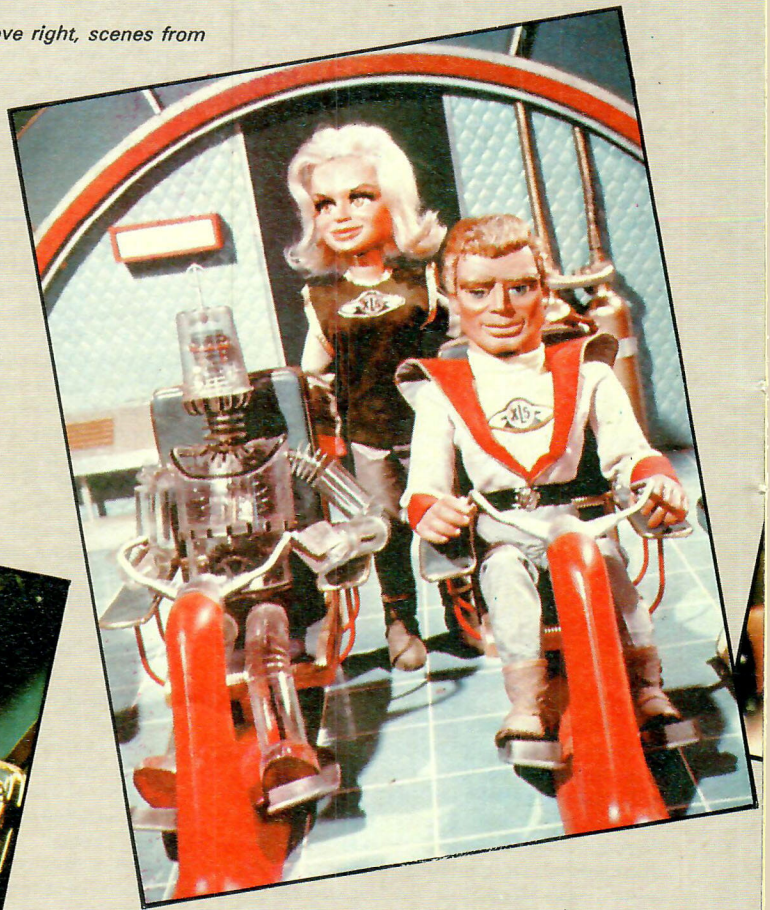
The EARLY AND





Left, above and above right, scenes from Supercar.





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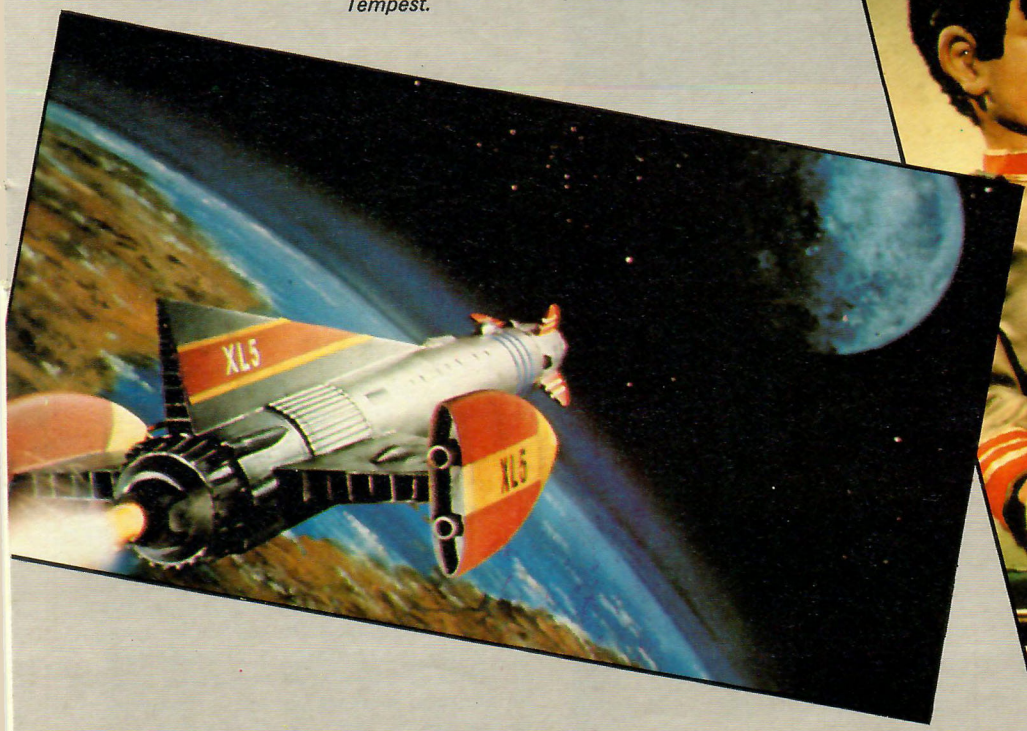
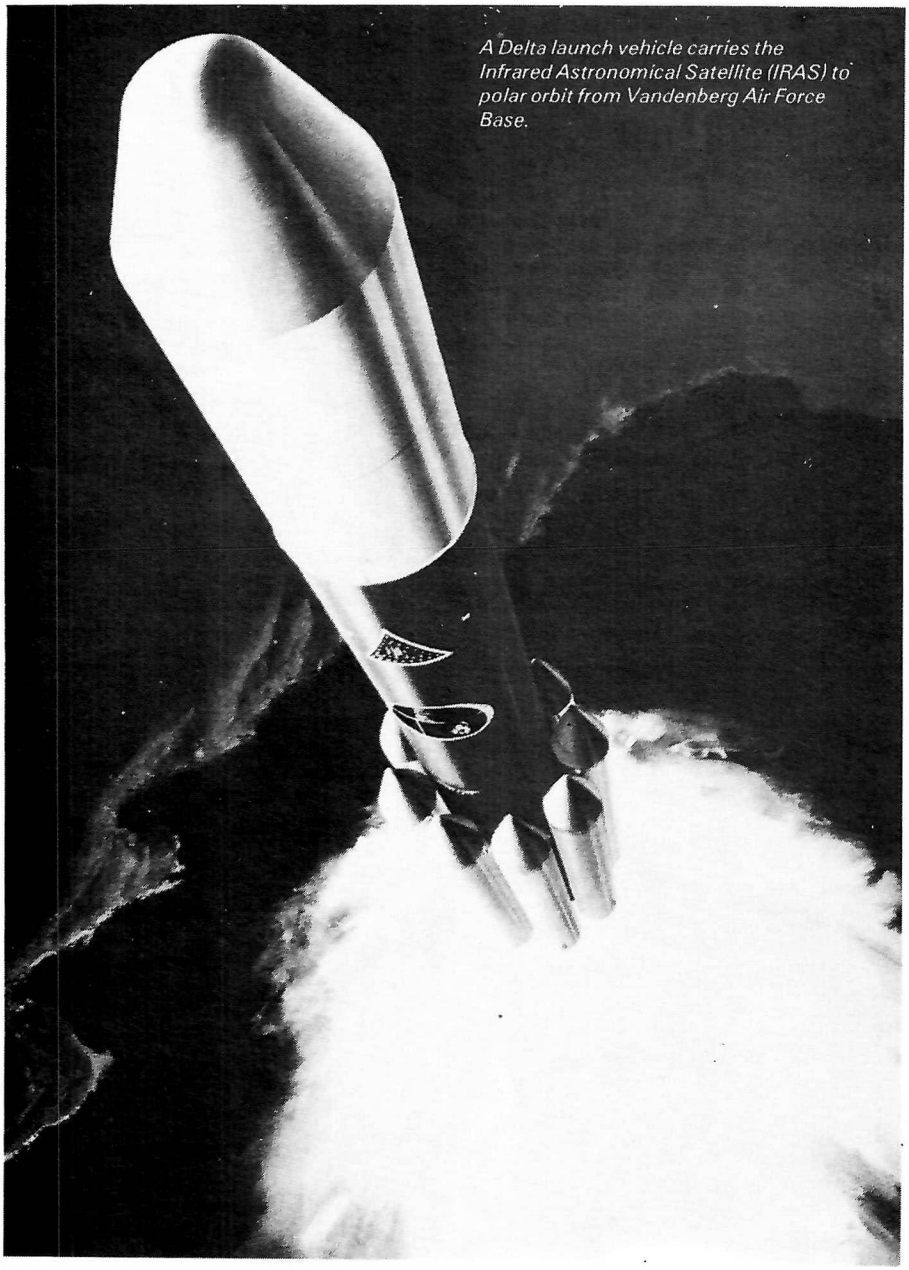
● Space Voyager *has tried unsuccessfully to find pictures of Torchy and Twizzle. We, the author and Fanderson would be grateful if any readers who could help would get in touch.*



Far left bottom, centre and below, scenes from Fireball XL5. Above, above and below right, model and puppets from Stingray, featuring Captain Troy Tempest.

IRAS

300 DAYS OF DISCOVERY



A Delta launch vehicle carries the Infrared Astronomical Satellite (IRAS) to polar orbit from Vandenberg Air Force Base.

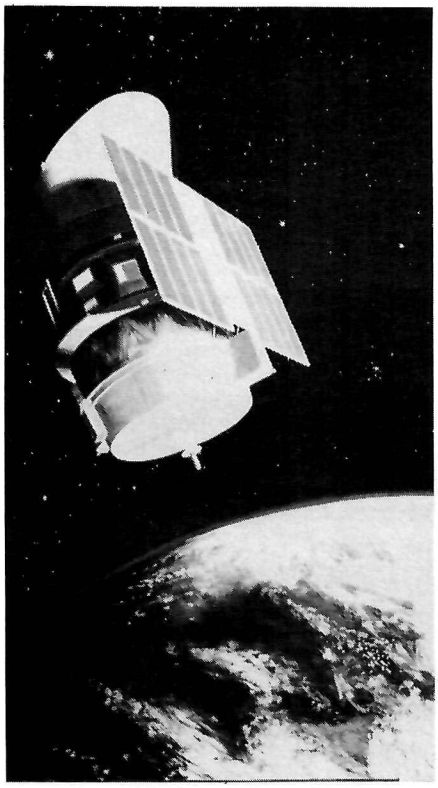
SPACE VOYAGER CONTRIBUTOR, DR JOHN DAVIES, WAS ONE OF THE MEMBERS OF THE BRITISH TEAM WORKING NOT ONLY TO CONTROL THE TELESCOPE AS IT CIRCLED THE EARTH, BUT ALSO TO DO PRIMARY ANALYSIS OF THE DATA AS IT STREAMED BACK DOWN TO US. IN THIS FIRST PART OF HIS REPORT DR DAVIES TELLS US HOW IRAS FOUND THE COMETS OTHER TELESCOPES COULDN'T REACH.

If you put your hand in front of an electric fire which has just been switched on you will feel the heat long before the element actually begins to glow. What your skin is sensing is infrared radiation, a form of electromagnetic energy very similar to visible light but of a slightly longer wavelength. Ordinary light has wavelengths which range from blue light at 0.4 microns to red light at 0.7 microns (a micron is one millionth of a meter). Wavelengths longer than about 1 millimeter are usually called microwaves and these merge into the even longer radio waves which may have wavelengths of thousands of meters. The gap in between, from about 1 micron to 1 millimeter, is the infrared range and is of great astronomical importance.

Before seeing why astronomers are so interested in the infrared region let us consider what happens as the electric fire continues to warm up. As the heating element gets hotter it starts to glow, because the wire begins to emit visible light as well as infrared energy. If it were possible to turn up the current to the fire beyond its normal limit (we can do this because we are conducting a thought experiment) the colour of the element would change from red to orange and then to yellow. Eventually the element would glow blue/white and the 'fire' would have become a very bright electric light.

What this tells us is that the colour, or wavelength, of light which an object emits is determined by its temperature. Stars, which have surface temperatures from about 10,000 to 2,000 degrees, emit mostly in the visible region. Our Sun, with a surface temperature of about 5,500 degrees, emits mostly yellow light. Objects cooler than about 1,000 degrees emit most of their energy not in the visible but in the infrared. In fact the infrared range of wavelengths from about one micron to about one millimetre corresponds to temperatures from about 1,500 to −263 degrees centigrade. To get rid of the minus signs most astronomers work using the absolute, or Kelvin, temperature scale in which 273 K is 0 C and absolute zero is 0 K (−273C). You should now be able to understand that well known piece of scientific graffiti, 'Absolute zero rules OK?'

If we consider the life cycle of a star the importance of infrared astronomy will become clear. Stars form inside huge clouds of gas and dust which are scattered throughout the spiral arms of our galaxy. When one of these clouds is compressed, by a nearby supernova blast, for example, it breaks up into a number of smaller clouds each one of which in turn



IRAS in orbit.

begins to collapse to form a star. As each of the cloudlets collapses it begins to heat up at the centre and takes the first step on the road to becoming a star. It takes about a million years before the collapsing cloudlet, sometimes called a protostar, gets hot enough to emit most of its energy in the form of visible light. Even then the star may be invisible from Earth since it is hidden from sight by the remains of the gas and dust which formed the original cloud. Only once most of this dust has been blown away can the star be observed directly from the ground, but by now the star formation process is nearly complete.

In the very early stages of starbirth, when the protostar is just beginning to heat up, almost all its radiation is emitted in the infrared and it is at these wavelengths that star birth is best studied. Fortunately because of its long wavelength infrared radiation can penetrate the gas and dust which surrounds the new stars better than visible light so using infrared energy it is actually possible to see deep into the star formation regions before the original cloud has dispersed.

Births and deaths of stars

Once a new star has formed it shines almost entirely in visible light and is of little interest to infrared astronomers until it reaches the last stages of its life. As the star runs out of nuclear fuel it begins to rearrange itself at the centre and often enters a phase in which material is ejected back into space. This material sometimes condenses to form an expanding shell of warm dust around the star. This shell of dust emits infrared radiation because it is warmed by the central star. Infrared observations of these circumstellar shells can provide information about the chemical composition of this dust, and thus about the makeup of the central star which ejected it.

Observations in the infrared are thus able to reveal both the birth and death of stars – a fact which makes it one of the most interesting areas of modern astronomy.

It is possible to make infrared observations using ordinary telescopes but the Earth's atmosphere presents two very important limitations. Firstly the water vapour in the air absorbs many of the infrared wavelengths of interest, leaving only a small number of windows through which to look, and secondly, because it is comparatively warm, the atmosphere itself emits in the infrared. The telescope, its detector and human beings are also strong infrared sources, and although it is possible to reduce some of this by cooling the detectors to very low temperatures it is impossible to cool the entire telescope (and most astronomers have very strong views about being frozen solid!). In view of all these difficulties infrared astronomy has been jokingly compared to doing ordinary optical astronomy in the daytime using a white hot telescope while wearing a luminous coat!

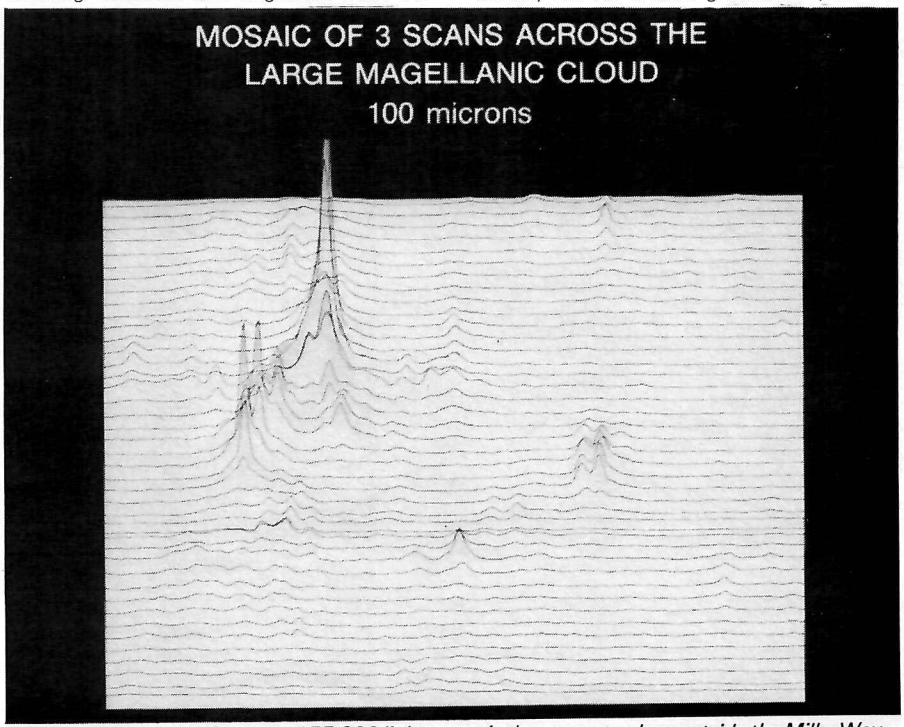
To get around these problems astronomers began to launch small telescopes above most of the atmosphere using either balloons or rockets but such flights provided only very limited amounts of observing time. What was needed was a satellite which could make a complete infrared survey of the sky, unlimited by the atmosphere, over many months of uninterrupted observations. In 1983 this became a reality with the launch of the InfraRed Astronomical Satellite IRAS, its mission – "to boldy scan where no satellite had scanned before!"

Mission invisible

The IRAS mission was an international one, involving scientists and engineers from the USA, the Netherlands and Britain. The USA provided the actual IRAS telescope and its sensitive infrared detectors, a free launch and facilities for detailed analysis of the results at the Jet Propulsion Laboratory at Pasadena, California. The Dutch team designed and built the rest of the satellite and also provided some extra scientific instruments known as the Dutch Additional experiment or DAX. The British contribution was the provision of a ground control station at the Rutherford Appleton Laboratory in Oxfordshire. As well as actually controlling the satellite the ground station also allowed scientists to have a quick look at the data returned by IRAS and so was officially known as the Preliminary Analysis Facility or PAF.

The IRAS satellite was more than 3.5 meters tall and over 2 meters in diameter. It weighed just over a ton making it one of the heaviest scientific satellites ever launched. At its heart was a 60 cm reflecting telescope surrounded by a doughnut shaped cooling vessel containing superfluid helium. Since superfluid helium boils at 2 K, two degrees above absolute zero, the whole IRAS telescope was maintained at very low temperatures. This reduced the infrared radiation from the telescope itself to a very low level, allowing the use of detectors at least a hundred times more sensitive than those used for ground based telescopes.

Infrared radiation was focused by the telescope onto an incredibly complex array of detectors. Sixty-four individual semiconducter detectors, plus eight visible star sensors and the apertures for the DAX were squeezed into an array only a few centimeters in diameter. The detectors were grouped into rows, each sensitive to different wavelength ranges, and cleverly laid out to allow ground computers to



The Large Magellanic Cloud, at 155,000 light years, is the nearest galaxy outside the Milky Way. Very intense and complex emission is seen from the vicinity of the 30 Doradus ('Tarantula') nebula to the left of centre. A new cluster of massive stars (each 10-100 times heavier than the sun) has probably been recently born here, although it has been suggested that this nebula contains a monster star, thousands of times more massive than the sun. These pictures will help astronomers to understand the processes by which new stars condense out of clouds of gas dust.

determine the co-ordinates of each object detected.

The telescope and its detectors were mounted on top of the main spacecraft which carried the electronics and attitude control system. Solar panels were attached to one side of IRAS to generate electrical power and the telescope opening was topped by a sunshade to stop sunlight entering the telescope and burning out the detectors. To protect the telescope before launch and to stop ice forming on the very cold mirror surfaces the open end of the telescope was covered by an ejectable lid. This cover was designed to be jettisoned a few days after launch.

Launch

IRAS was launched by a Delta rocket from Vandenberg Air Force Base in California on January 26th 1983. (It was actually still January 25th in the USA due to the time difference). The launch was perfect and IRAS was inserted into a polar orbit 900 kilometers high. Apart from a minor problem with the attitude control system which was quickly corrected by some modifications to the on-board computer software IRAS was working well and after a five day checkout the telescope cover was ejected. For the first time IRAS was able to view the universe.

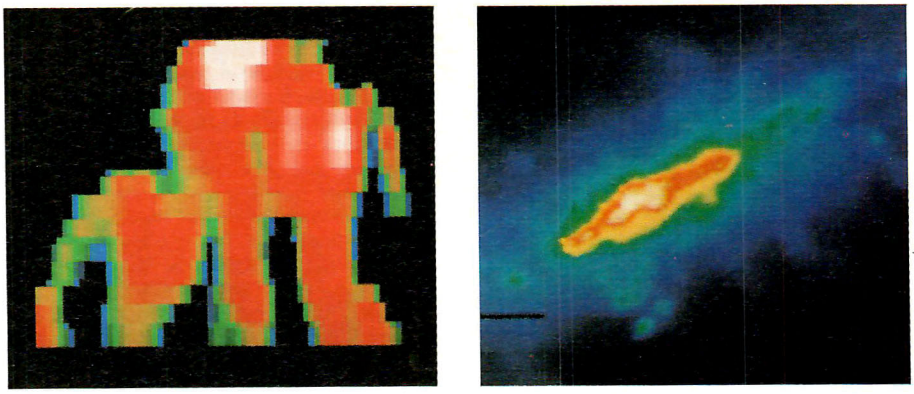
I was fortunate to be present at an informal meeting held amongst the scientists a few days after the cover was jettisoned. The meeting was held to update the operations team (who were working flat out getting the spacecraft fully operational) on the performance of the scientific instruments. One of the first results shown was the IRAS observation of the telescope cover as it drifted away from the satellite after being jettisoned. This seemed to everyone at the meeting a very good omen for the months ahead.

From its polar orbit IRAS swept out a circular strip of sky each time it went around the Earth. The orbit was arranged so that each scan partly overlapped the scan before, allowing anything detected on one orbit to the confirmed on the next. To improve the reliability of the survey each region of the sky was scanned again about a week later and only infrared sources detected at the same position each time were included in the final catalogues. This check was necessary since the many thousands of asteroids orbiting between Mars and Jupiter were bright enough to be detected by IRAS and would otherwise have confused the catalogue, which was supposed to contain only fixed infrared sources, ie objects outside our solar system.

Not all of the satellite's time was spent on the survey, the need to avoid pointing too close to the Sun left some time available for detailed observations of specific objects. These Additional Observations, or AD's, could use either the main survey detectors, or the instruments in the DAX. The only snag with the ADs was that because of the scanning nature of the IRAS orbit each observation was limited to a maximum of about eight minutes. The total time available for ADs, about forty percent of the total mission, was divided up amongst astronomers from the three participating countries and produced some very exciting new discoveries.

The moving object search

Since the purpose of the IRAS mission was to make a catalogue of fixed infrared sources it was planned to automatically reject any moving objects found in the data. However it was realised that amongst these rejected objects might be new, and possibly interesting asteroids and comets. In particular it seemed possible that IRAS might detect a large number of Apollo asteroids, small rocky objects a kilometer or two in diameter which cross the Earth's orbit (See *Space Voyager* 10, Aug/Sept 1984 for more information on asteroids).



Infra-red photographs taken by IRAS of gas and comet formations (left is the 'Tarantula') which, using standard observation equipment, would prove invisible.

The Operations Centre in California which monitored IRAS and collated the resulting discoveries.

With this in mind astronomers from Leicester University set up a network of ground based telescopes which would follow up any new objects reported by IRAS and provide the information needed to calculate the orbits of the new discoveries. These telescopes were located all over the world including Japan, Australia, the USA and Eastern Europe.

The first success for the moving object search came on April 26, 1983 when IRAS found an unidentified moving object in the constellation of Cygnus, The Swan. After careful checking of the IRAS data I sent out an alert and confirming photographs were taken in Sweden which showed the object to be a bright new comet. In fact the comet was heading almost directly towards the Earth, and brightened so quickly that it was discovered independently by two amateur astronomers, Genadi Araki in Japan and George Alcock from Northamptonshire. According to the international convention it was named IRAS-Araki-Alcock. The comet proved to be especially interesting since it passed within three million miles of the Earth a few days after its discovery, the second closest approach of a comet ever recorded. Only Lexell's comet, in 1770, is known to have been nearer to Earth. IRAS was also able to make some hastily arranged

additional observations of the comet, mapping out the warm dust around the comet's centre, and discovering that the region of dust extended further than appeared from ordinary photographs.

A second success followed a few weeks later with the discovery of a very faint comet, designated comet IRAS 1983f, two hundred million kilometers from Earth. This comet had already been around the Sun and was fading fast as it headed back into deep space. But for IRAS it would never have been found at all.

By the end of the mission the moving object programme had discovered a further four comets, two of which are periodic comets, that is to say they will return regularly to the Sun in the years ahead. Unlike most periodic comets which orbit very close to the plane of the solar system (the ecliptic plane), both of the periodic IRAS comets have highly inclined orbits and studies of these are underway to try and understand how the comets got into such unusual orbits. The most likely explanation is they each underwent a close encounter with either Jupiter or Saturn which tipped their orbits out of the ecliptic plane.

Infrared tail

The moving object programme made another important discovery regarding comets. In July 1983 IRAS detected what appeared to be a number of moving objects moving along in formation. After a few days I realised that these were associated with a well known periodic comet called Tempel-2. This association was confirmed a few days later when IRAS detected the comet itself. Further analysis of the data revealed that IRAS had detected a huge dust tail following the comet, and that the tail was about seventy million kilometers long.

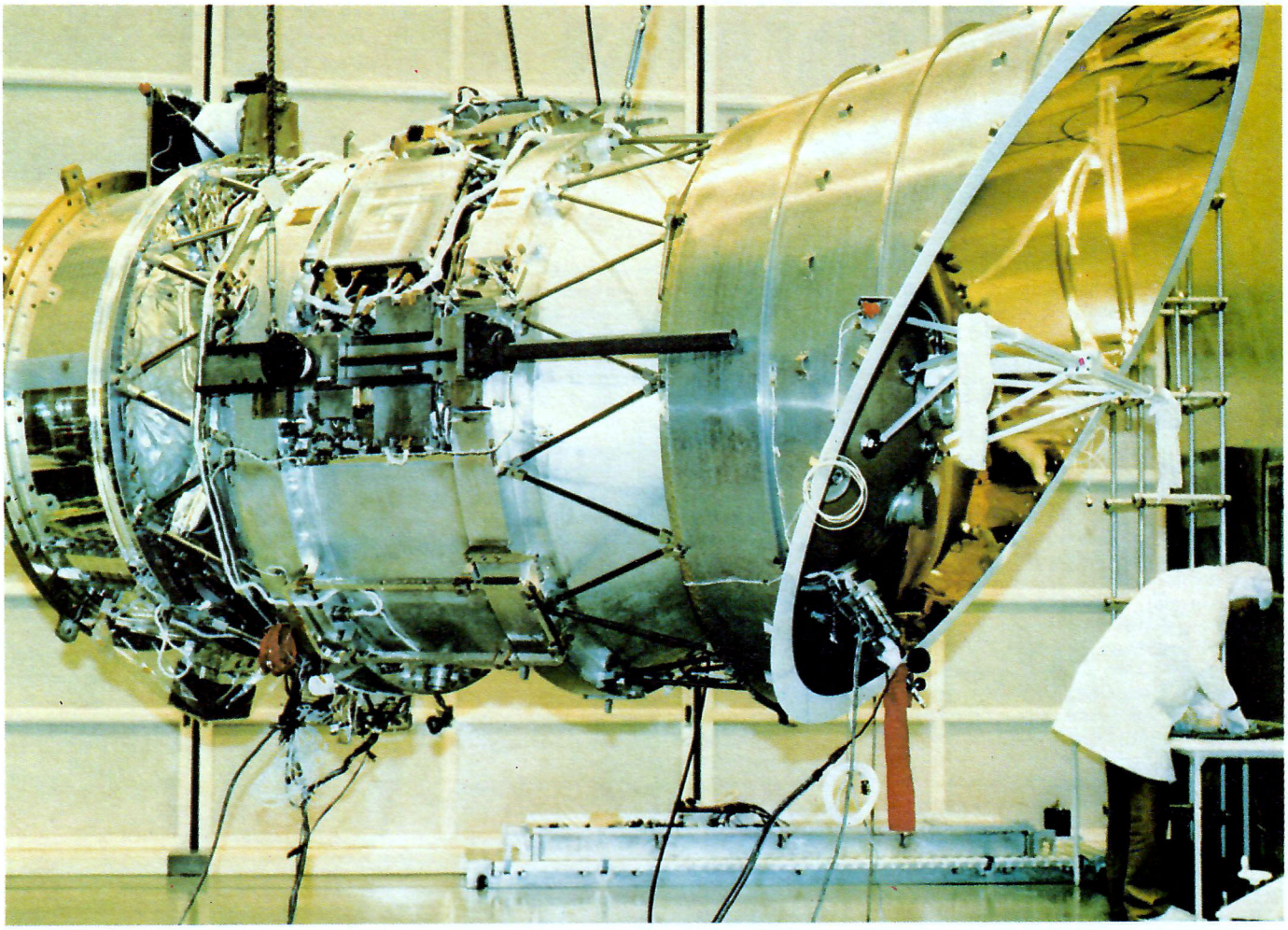
This discovery was totally unexpected since Tempel-2 has never been known to display a long tail when observed in visible light. The infrared tail is composed of dust blown off the comet and warmed by the Sun just enough to be detectable in the infrared. It is possible, indeed quite likely, that similar tails may be found when IRAS data on other comets is examined in more detail.

Asteroid discoveries

IRAS also discovered several asteroids, including two of the Apollo group of Earth crossers. The first of these, given the temporary designation 1983TB, was rather unusual. When the orbit of 1983TB was calculated it was found to be almost the same as the orbit of the Geminid meteor stream. Meteor streams are believed to be the remains of dust ejected from comets (most streams can be identified with specific comets) but the parent comet of the Geminids has never been found. This may mean that 1983TB is not a normal rocky asteroid but the nucleus of a comet which has run out of frozen gasses and become inactive. If this is so 1983TB could be the missing link between comets and certain types of asteroid. Further observations from the ground are planned to resolve this exciting possibility.

IRAS had one more surprise in store for astronomers interested in the solar system when IRAS maps of the zodiacal dust were examined. It has been known for a long time that the solar system is filled by a cloud of fine dust, which is concentrated in the ecliptic plane. The dust can even be seen with the naked eye from a very dark site. It appears as a faint cane of light stretching up from the horizon through the constellations of the zodiac – hence its name. Astronomers had expected that the Zodiacal dust would fall away smoothly on either side of the ecliptic plane however IRAS observations revealed a more complex picture with bands of dust about nine degrees above and below the plane.

The existence of the zodiacal bands is probably due to collisions within the asteroid belt, either between asteroids or between an asteroid and a comet. If two such objects collided the impact would generate plenty of dust, and if the orbit of either colliding body was at a nine degree angle to the ecliptic plane the dust would finish up in a similar orbit. Eventually the individual dust grains would spread out round the orbit to produce the observed zodiacal dust bands.



IRAS, the infra-red satellite. Its 300 day mission now at an end, IRAS has made many new discoveries to further our scientific knowledge of space.

REVELL'S ROBOTS

WITH NO SIGN OF THE TOYSHOP ROBOT WARS LETTING UP, BOBBY WOODER EXAMINES THE FIRST OF REVELL'S RECENTLY RELEASED SERIES OF ROBOTECH DEFENDERS.

Although this is a re-boxed **Takara** kit that **Revell** have got their hands on, it is by far the best robot kit I have seen or built to date.

One thing that impressed me was the number of parts involved. One hundred and thirty three – including 37 polythene bushes. Most of the joints use these bushes so they should be firm and relatively free of glue or paint.

All parts were well moulded and clean, not a trace of flash to be found anywhere. The detailing was very good indeed – for example, the rocket pack on Ziyon's left shoulder looks as if the warheads were put in separately, but in fact the front section and warheads were moulded in one piece.

One thing that lends realism and credibility to the robot is its head: it's really not a head but a cockpit with a crew of two – a pilot/driver in front and a navigator/gunner behind. The navigator's seat is raised to give him a clear view over the pilot's head through the armoured plexiglass canopy.

The idea of a pair of guns each side of the cockpit is good, but I think that they would be better situated lower down the body as the muzzle-flash would scorch the canopy and temporarily blind the pilot when they were fired.

The robot's hands look almost too much like human hands for my taste, but they do make a change from the usual clenched fist, and it is nice to see a finger curled around the gun trigger.

The gun hand does present a problem, however, as it has to be assembled around the hand grip, making it almost impossible to paint the gun and hand together.

Unless you are leaving the model unpainted (perish the thought!) assemble the gun and paint it, leaving it to dry thoroughly after each operation. Meanwhile, decide what colour you want your robot and paint the hand halves accordingly. When dry, assemble the two halves around the hand grip, ensuring that surfaces to which the glue is applied are free of paint.

A point to remember is that the ball joint on the hand is a very tight fit in the poly bush of the wrist. If it is too tight the ball joint will break off (as I found to my cost). If the ball will not pop into the poly bush easily, reduce the size slightly by carefully sanding with fine wet'n'dry sandpaper.

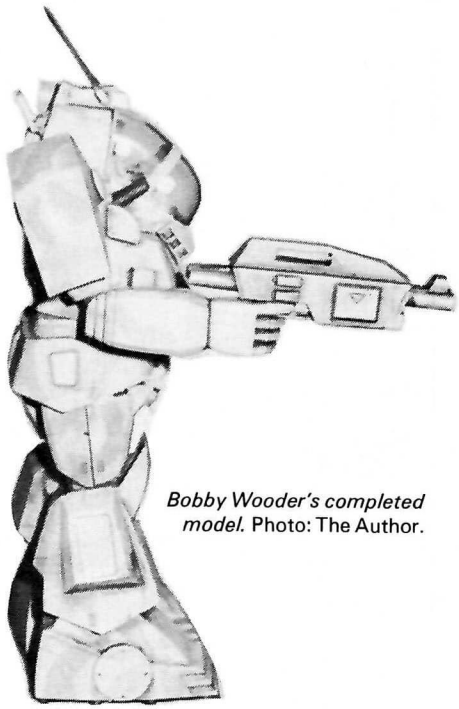
The lower leg sections on my model were not a true fit, mainly because there are no locating pins and they rely on the upper leg and foot joints for this. The only solution is to file the leg section until the area is smooth and finish with wet'n'dry.

Ziyon seems to follow Japanese tradition by having oversized lower leg sections and big feet but this does seem sensible as the box art depicts the robot in a winter setting and the scale figure on skis supplied with the kit supports this. Big feet would be needed while walking on snow, slush or mud to displace the robot's obvious great weight.

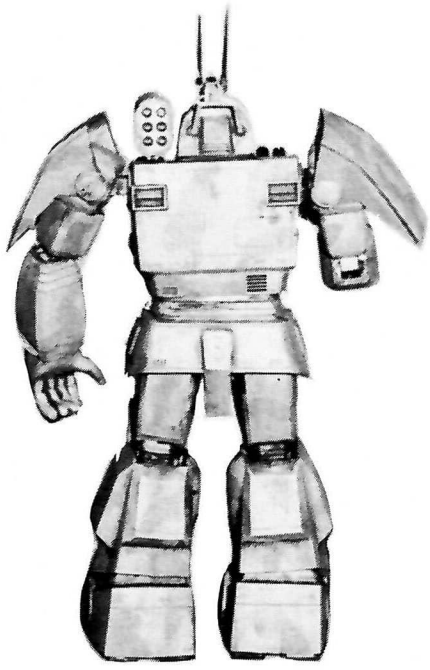
As the box art suggests overall white with various areas in red, light grey and dark grey, and the instructions suggest metallic blue grey with light blue, I think the colour scheme should be left to individual choice. My model was painted a pale blue grey with irregular light grey streaks and blotches. The cockpit is painted Cockpit Grey with tan seats and matt black instrument panels. The crew's suits are khaki with white helmets as is the skier. The antennae, chest guns and the face of the rocket pack are painted matt black, and the handgun is painted Gunmetal grey. A fairly liberal dirtying down, concentrating mainly on the legs and feet will complete Ziyon.

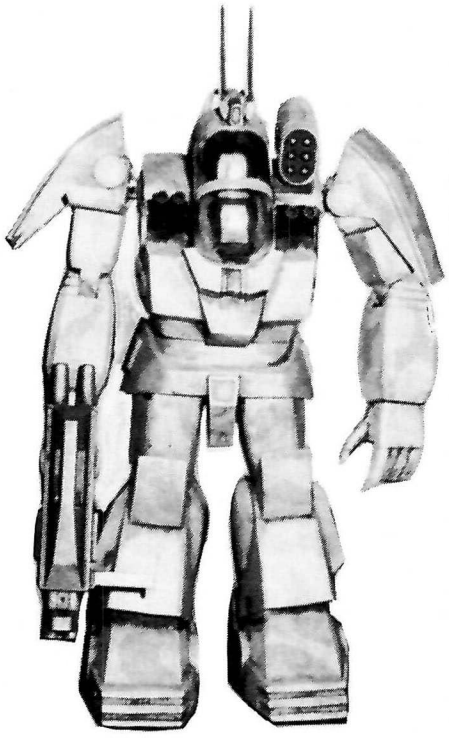
The instructions come in an eight page booklet which is very clear and concise and I recommend that you don't deviate from the steps shown.

In conclusion, if the rest of Revell's robots are as good as this one, it may be worth collecting the entire range.



Bobby Wooder's completed model. Photo: The Author.





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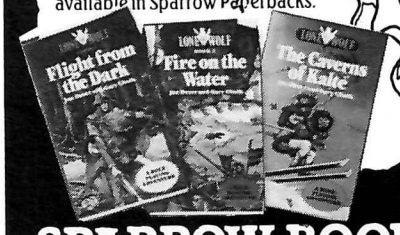

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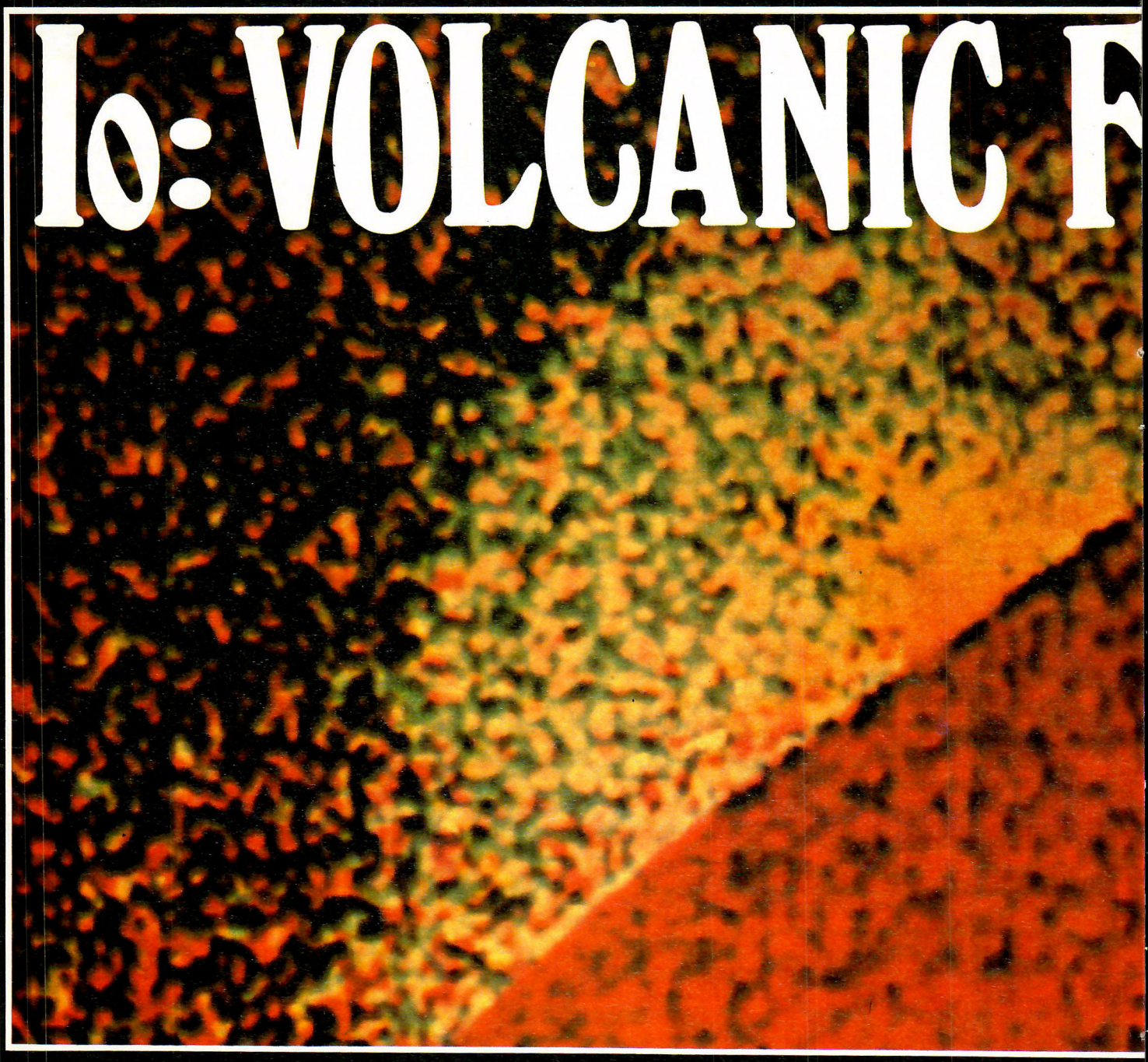


SCIENTISTS OFTEN DISCOVER EXCEPTIONS TO RULES WHICH CAUSE THEM TO THINK AGAIN. IO, TINY MOON OF JUPITER, IS NOT ONLY A NOISOME PLACE TO VISIT, BUT IT IS CAUSING MANY HEADS TO BE SCRATCHED, AS ALDO RABAIOTTI RELATES.

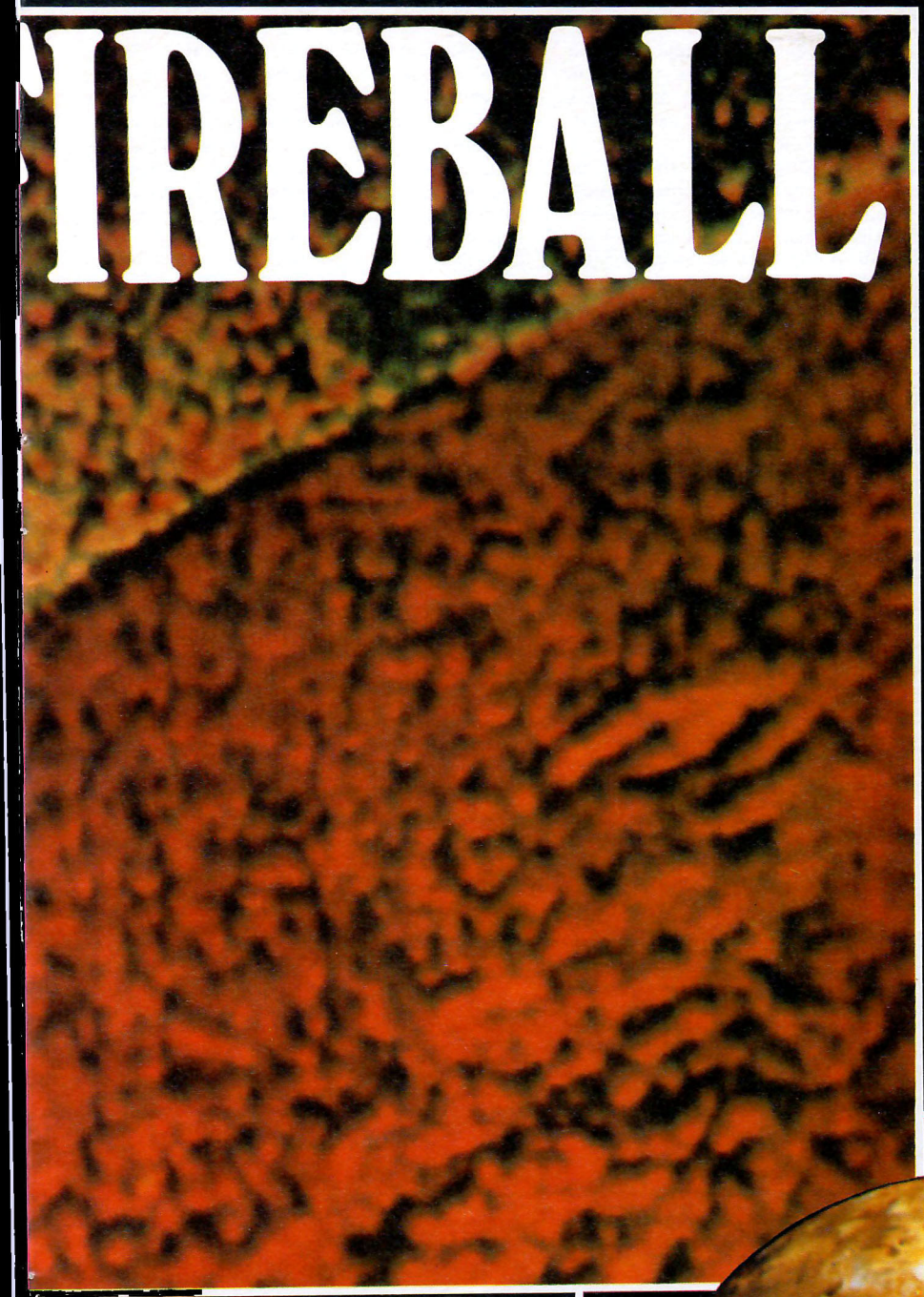
One of the most marked features of our mature solar system is its apparent lack of exuberant planetary activity. Aside from the occasional intrusion of fleeting intersteller nomads, the planets follow familiar, predictable paths and are generally stable to the extent that visible surface activity is limited and generally unchanging. Our solar system is a very stable, very regular corner of the galaxy, in fact, rather boring!

A small mechanical device outfitted with photographic equipment and sensors, having travelled for tens of millions of miles, came across a small dynamically energetic world lying not far from Galileo's preoccupation – Jupiter.

Orbiting 350,200 kms from the gaseous giant, is the small, innocuous satellite Io. From Earth this Galilean moon is barely discernible as a speck of orange light, but of the presently accounted for 16 moons, Io alone is a hot burning globe, the size of our moon, turning itself inside out from the extensive erupting sulphur, spilling out onto its ever replaced surface. Io, named after one of the mythological lovers of the god Jupiter, and looking like a pock-marked satsuma, has been shown to be the most active volcanic body in the solar system. A planet, literally, of fire and brimstone!

Before Voyager 1 encountered Io, astrophysicists presumed it would have had an ancient cratered surface very much like our own moon. In a startling speculative paper published just three days before Voyager 1's close encounter with Io, Stanton J Peale of the University of California in Santa Barbara; Patrick M Cassen and Ray T Reynolds of NASA's Ames Research Centre envisaged that since the satellite would be subjected to regular resonant gravitational forces exerted by its sister moons, (Ganymede and Europa in particular) its circular orbit would be distorted. This would cause Io to move in-and-out slightly within Jupiter's powerful gravitational field, so that it would be repeatedly flexed by tidal forces and an enormous amount of frictional heat would be produced in its interior. Since the heat generated through expansion and

IREBALL



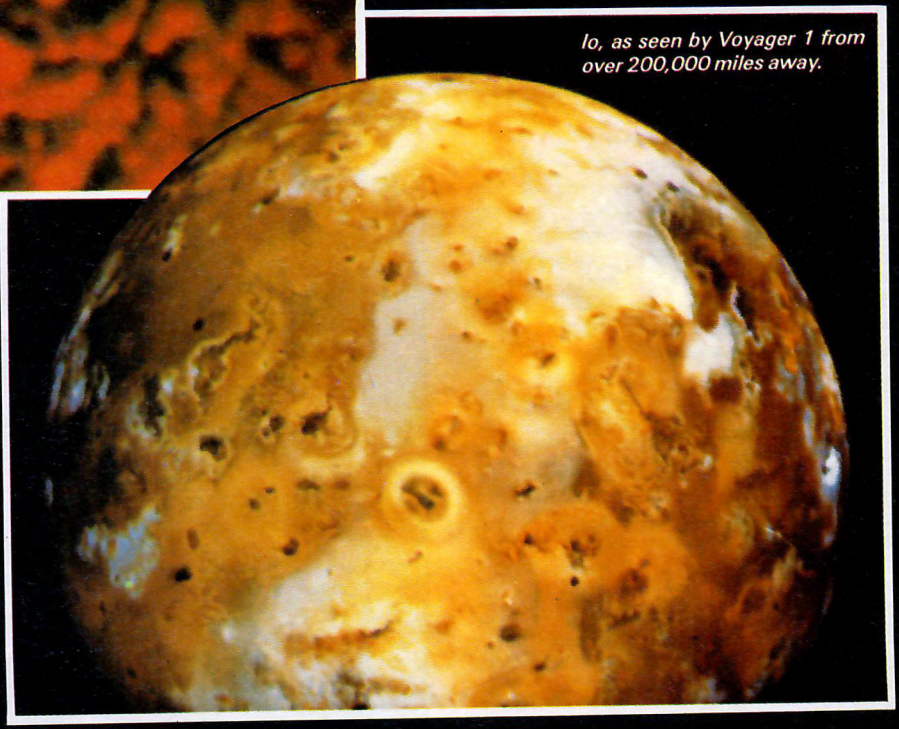
contraction would ultimately have to be released through the surface, Peale, Cassen and Reynolds surmised 'widespread and recurrent surface volcanism would occur'. Heat in the order of a million, million watts would liquify the core, but even this would be but one percent of Io's total volcanic energy output.

Rotting orange

How accurate their speculation turned out to be. Observers approaching Io would see it as a blotchy disk, looking like a rotting orange. An astronaut standing on its surface would see a world straight from Faust: continually erupting volcanoes, sulphur vents, and jets issuing flush at the surface. A red-orange surface of molten sulphur and the sky dominated by the multi-hued facade of Jupiter, appearing over 40 times wider than the Sun or moon in our own sky. For $2\frac{1}{2}$ hours at a time the looming disk of Jupiter, a thousand times larger than the Earth, eclipses the Sun, bringing an intense cold of nearly —200 degrees celsius, during which sulphur falls as frost or 'snow' lightening the surface. As Io emerges from eclipse, this frozen layer evaporates as a faintly luminous orange gas.

The first images relayed by Voyager 1 showed detectable surface markings with small dark spots, some of which were surrounded by faint rings. First impressions felt that these were the expected large impact craters common to the other Galilean moons. High resolution images soon discounted this preliminary conclusion, as no impact craters were located at all. At maximum resolution a crater as small as one kilometre would have been clearly visible.

Io's surface displays a host of intruging land forms, including sinuous escarpments and faults. Images transmitted just before Voyager 1's closest pass to Io finally gave a clue to the geophysical processes that might be re-sculpting its surface features. One photograph revealed a circular depression about 50 kms in diameter, rimmed by a cliff and surrounded by a radiating flow pattern. The feature resembled volcanic forms seen on other terrestrial bodies. Over one hundred caldera, or large collapsed craters created when lava flows out of, or is withdrawn from the magma chamber so that the surface above collapses, have been pin-pointed. The molten sulphur flows radiating from the presumed volcanic epicentres are multi-coloured – black (hottest), yellow, orange and brown. To account for the variety of colours, members of the Voyager imaging teams have suggested that the flows consist of everything from sulphur-coloured basalt to pure sulphur. It has also been suggested that Io's interior might not be entirely of sulphur. Geologists believe that the body has a core of molten rock overlain by a sea of liquid sulphur and sulphur dioxide. Every so often boiling sulphur dioxide erupts through crustal weaknesses, frothing out to form a volcanic plume and allowing the liquified sulphur to ooze onto the surface.



Io, as seen by Voyager 1 from over 200,000 miles away.

Because of such activity the outer few kilometres of Io have been recycled endlessly. Io's volcanoes emit no water vapour or carbon dioxide gas; these were probably lost long ago, leaving sulphur to bubble out from the interior. If the surface of Io was so young and if volcanic activity was as recent as the pictures indicated, then this activity should be continuing even today. No one on the Voyager crew ever dreamt of seeing an active volcano erupting yet. . .a few days after the Voyager 1 encounter with Jupiter, Linda Morabito, a JPL engineer at Caltech, was examining long-range images of Io taken for navigation purposes. The images had been overexposed to bring out the background stars and on one she noted a large bright umbrella-shaped form off the edge of Io's Southern Hemisphere. When efforts to explain it as an artifact scanning flare or sporadic phenomenon failed, the conclusion was drawn that the form was indeed a volcanic plume arching its way 270 kms above Io's surface.

Ancient Fire Gods

In March 1979, after the existence of the cloud had been accepted, a search revealed that there were no fewer than eight active volcanoes, throwing up plumes ranging from 70 to 300 kms in height and with velocities reaching 3,600 kms/h. The eight were named after the mythical fire gods Pele, Loki, Prometheus, Volund, Amirani, Maui, Marduk and Masubi. When Voyager 2 arrived four months later, seven of the eight were still erupting. Pele has ceased but Loki was erupting more strongly than ever, spouting material 210 kms into space.

Some of these plumes are highly symmetrical. In most instances the ejected material rises to a height of about 100 kms as a fan-shaped spray, to form a halo up to 500 kms around the vent. Pele, for example, was then surrounded by a horseshoe-shaped arc of erupted material 1,000 kms across. At least one new halo appeared around a vent between the visits of the two Voyagers, but neither actually photographed the vent erupting. Continued Earth-based observation has detected sudden surges of heat output from Io – evidence of other unseen volcanic eruptions on this intensely hot world.

Some plumes exhibit a large diffuse zone in the ultraviolet and a smaller inner core in the visible waveband. This inner core, which is often asymmetrical, may consist of solid particles ejected on ballistic trajectories. The ultraviolet zone is probably condensed, symmetrically expanding gas. Geologists estimate that as much as one metre of new surface material is erupted every 10,000 years because of all this volcanic activity.

A further interesting phenomenon is the existence of patchy white and bluish-white fog, occurring along scarps and faults and observed in many areas, but especially in the South polar quarter. These patches are diffuse, often variable and apparently cover the underlying surface and consequently, it was suggested that they might be clouds, or cloud-deposited material, produced by gas leaking out of the interior and condensing into some sort of crystallised 'snow'. One of the key factors that led to this preliminary explanation of both the plumes and these sporadic white patches was the discovery, by John Pearl of the Goddard Flight Centre, that Io has an ultra-thin atmosphere of sulphur dioxide. Measurements of infrared absorption have established that during the daytime, the tenuous atmosphere has a pressure of about one tenth of a microbar, a ten millionth of our own atmospheric pressure at sea level.

Another infrared absorption characteristic discovered in the course of telescopic observations made from Earth by Dale P Cruikshank of the University of Hawaii, Manoa, was noticed by a number of observers as being probably due to sulphur dioxide frost on Io's surface. Recent spectophotometric analysis of Voyager images suggest that these large cirrus-like regions, could be about half sulphur dioxide and half sulphur. These findings suggest that sulphur dioxide may be abundant in Io's surface strata. If this is indeed the case, then liquid sulphur dioxide will collect in a belt, the top of which will be a few hundred metres below the surface. The presence of reservoirs of liquid sulphur dioxide may provide a simple explanation of what appear to be ice 'clouds' forming from fractures in the crust, the liquid sulphur dioxide being exuded to the surface along a fault, or at the base of a scarp and exploding into ice-fog as it is forced out under internal pressure. John F McCauley of the US Geological Survey and his colleagues think that this could account for erosion along the scarps.

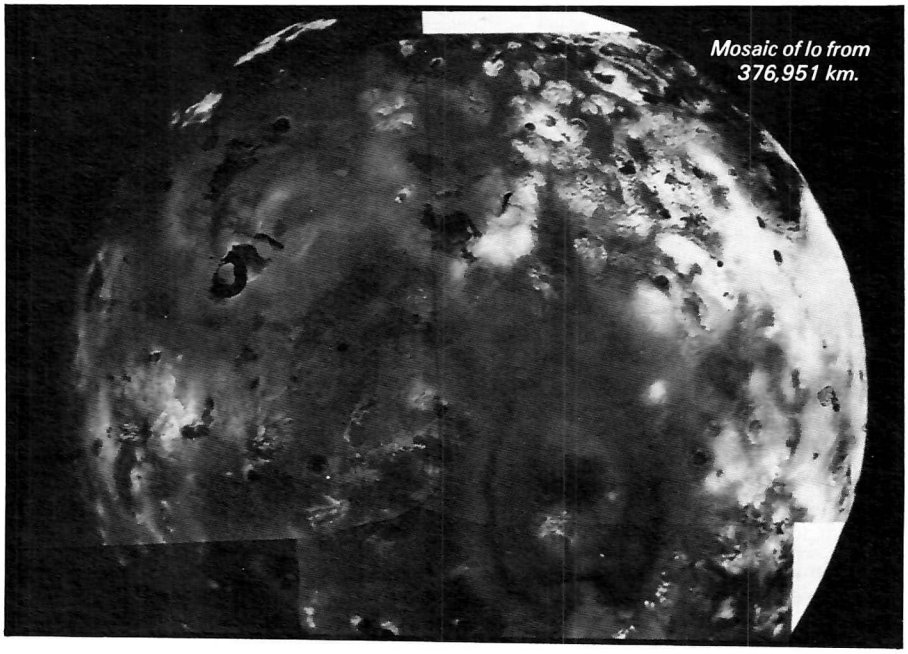
Additional investigation carried out by Bradford A Smith of the University of Arizona has suggested that the liquid sulphur dioxide could cause violent eruptions, much in the same way as water does in the Earth's crust. On reaching the surface its velocity would be between 500 and 1,000 metres per second – capable of catapulting material far into space. For such a theory to be correct, Io would have to have oceans of pure sulphur – a model supported by Carl Sagan of Cornell University.

Magnetic fields

Astronomers now feel that Io's extensive volcanic activity might be the cause of Jupiter's powerful electro-magnetic field. Ever since 1955, when a startled group of American radio astronomers tuned-in to radio emission from Jupiter, it has been known that the giant planet must be sheathed in a large and powerful magnetic field. This was later confirmed by the Pioneer 10 in late 1973. Planets rarely emit radiation in the radio frequency band, but scientists believe that Jupiter's emissions are produced by the enormous convection currents generated in the boiling-cold hydrogen and helium. The field created is 10,000 times stronger than Earth's Van Allen belt. This shell traps electrons in a spiral to produce Jupiter's energetic radio waves through a process called synchrotronism. Even so, the relationship between this field and the enigmatic Io still remains a mystery. What is known is that Io, rather surprisingly because of its lack of size, possesses an ionosphere and this interacts with the Jovian ionosphere. That such a small moon could interact with a planet the size of Jupiter is certainly remarkable, but the effects are clearly visible.

The most noticeable effect Io has is its regulatory effect on the decametre (670-7.5 m waveband) radio-wavelength, which occurs in bursts and is often referred to as Jovian noise. This is most probably caused by electrical discharges in the Jovian atmosphere and ionosphere; originating from areas no more than 400 km across. The occurrence of these specific bursts is not random but is linked to Io's orbital position around Jupiter. Confirmation of this interaction has led to a hypothesis that might account for Io's fiery heart. Astronomers believe that through Jupiter's magnetic field and the linking of the magnetic poles of both planet and moon, there exists a 'flux' tube – a magnetic pathway through which flows electrical current of 5 to 10 million amperes at 400,000 volts. Such a colossal amount of energy would heat Io up like a celestial oven, turning it into a gigantic fireball which, from transmitted data, it certainly is.

Further investigation of Io would not go amiss because it is one of the most interesting and energetic bodies yet encountered by space probes. Whether the next major mission to Jupiter named, appropriately enough, Galileo, can cast additional light on this curious planet, hidden from us by distance, remains to be seen.



Mosaic of Io from 376,951 km.

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Rates: £10 to 15th April, £11 to 15th June, £12 on door. Support £3. Special Rates for unemployed and pensioners. An SAE sent to:- Iain Thomas, 162 Kingsheath Avenue, Rutherglen, Glasgow, will bring full details, hotel rates, your registration form, etc. Welcome!

CONTRIBUTOR'S GUIDELINES

or

How to get into print in five easy lessons

The Space Voyager office in the bowels of A.S.P. regularly receives articles sent in by readers for publication. If you want to send something in for consideration, you can increase your chances of success by following these simple rules:

1. Your article must be typed, double-spaced, on one side only of A4 paper, with wide margins (an inch on either side).
2. You should send all the illustrations necessary (the more the merrier) with the article. Drawings need not be works of art – the Voyager drawing office will probably redraw them anyway. Photographic images can be either prints or transparencies, colour or black and white.
3. You must be the copyright owner of all the material submitted or have obtained whatever clearances are necessary for publication.
4. If a reproduction fee is payable or permission is required for the publication of photos or drawings, this must have been complied with before the article is submitted.
5. Articles that have not been specifically commissioned for publication in Space Voyager by the editor must be accompanied by a stamped, self-addressed envelope.

Whilst A.S.P. and Space Voyager take great care when handling readers' submissions, we cannot be held responsible for any loss or damage to unsolicited material (so keep a copy!).

BLAKE'S 7 COMPETITION

Attention all *Blake's 7* fans! *Episode Guide* and *Afterlife* author Tony Attwood has promised to award signed copies of his books to the winners of the competition which appears below.

With his knowledge of the programme, Tony has devised this quiz and then to further weed out the winners he suggests you tell us in not more than 50 words why YOU think Avon shot Blake . . .

The questions:

1 – Only one leading character in *Blake's 7* appeared in every single episode of the TV series. Who, and who played the character.
2 – Before writing *Blake's 7*, Terry Nation wrote and created another long-running BBC SF series. Which?
3 – A father and his son had a major impact on the development of *Blake's 7* and between them were responsible for many of the things that happened to the crew of the Liberator and Scorpio. Who were they and what did they do?
4 – One actor played three major roles in *Blake's 7*. Who and what?
5 – How did *Dr Who* appear in *Blake's 7*?

Send your answers, with the 50 word explanation, to the *new* address on Page 3 by not later than May 1, with the corner coupon enclosed.

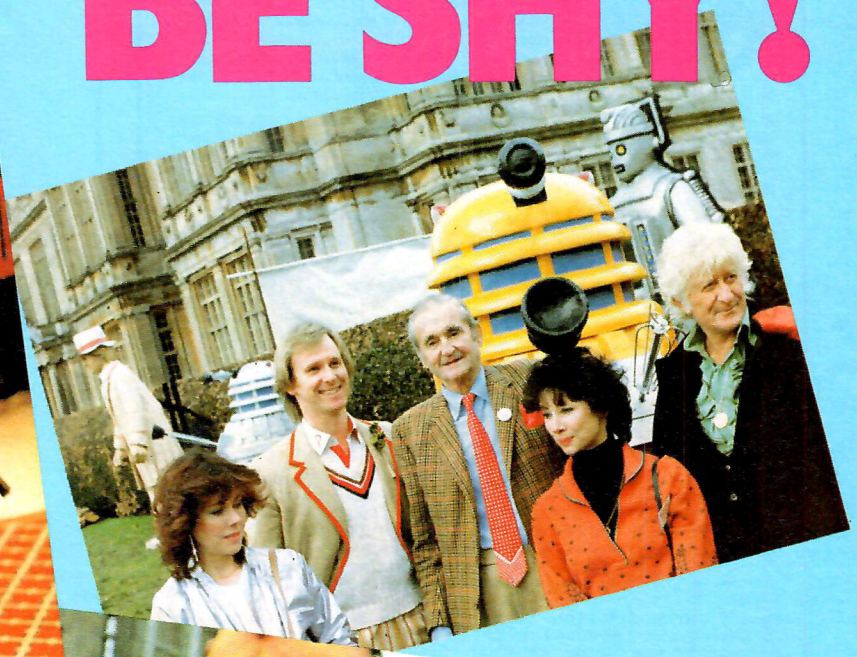
Rules

1. The competition will close on May 1, 1985.
2. Each entry must be accompanied by the entrant's name, address and the special coupon cut from this page. Each coupon covers only one entry.
3. Proof of posting will not be accepted as proof of receipt. Whilst every care will be taken, the publishers of *Space Voyager* cannot accept any responsibility for lost entries.
4. The competition is open to all residents of the United Kingdom. The staff of ASP Ltd and their relatives, and *Space Voyager*'s printers, advertisers and contributors, are not eligible for entry.
5. The submission of a competition entry implies acceptance of those rules. The editor's decision is final and no correspondence will be entered into.

BLAKE'S 7 Clip Coupon

DON'T BE SHY!

HOW MANY READERS, HAVING READ THE CONVENTION LIST IN DATABANK, HAVE WANTED TO ATTEND BUT NOT HAD THE NERVE? WENDY GRAHAM TELLS YOU WHAT GOES ON AND SAYS VERY FIRMLY . . .



Space Voyager magazine sells more than 30,000 copies per issue. The average SF convention has about 600 visitors. That means an awful lot of people are missing out on a wonderful time!

Now I'm sure that many of those who don't go to cons have very good reasons for not going, but I suspect that many are not going simply because they are nervous about the idea of spending a whole weekend in strange territory with people they've never met.

This article is to convince those nervous ones that there is a wonderful time just waiting for them.

Conventions for science fiction fans have been held in this country – and in many other countries – for many years now, with more and more seemingly held each year. They're all organised by very brave fans and proceeds, if any, go to a nominated charity.

But to the present. Let us suppose that by the time you've finished reading this you, gentle reader, who has never yet been to a convention, have decided 'this is for me'. What do you do?

Well first of all you turn to the conventions listing in *Voyager* and study the list. Are you a *Trek* fan, a *Who* or *Blake's* fan, you like the work of a certain author – scan the list and find a con based on that and you will find kindred souls. Or maybe you've no special favourite but only fixed holiday dates, fine, go with that.

Write to the address listed for a registration form and any fliers available, enclosing a stamped addressed envelope, and you'll get back a form giving details of when, where and how much, and asking what sort of hotel accommodation you'd like to reserve. Plus details of competitions you might like to enter.

First steps

If you can persuade a friend to accompany you, you'll probably feel more confident, as you'll at least have one person to talk to, and I'd recommend that first time out you give the drama and fancy dress contests a miss, until you've got the feel of it all. But go right ahead with the writing and art contests, if you want.

So send off your registration form and fee – usually about £15 which covers the cost of the guest, con printing and organising costs and so on and you should get your receipt with registration number back.

The last flier before the con will give details on how to get there – as some cities have traffic systems that have to be driven to be believed. The only way I've ever managed to get to the Crest in Newcastle is to go down a street marked 'buses only', and that was after circling the hotel for about 15 minutes.

When you get to the con, check in at your hotel and then go to the convention registration desk and collect your membership pack which will include a badge (to be worn at all times) and a convention book and programme.

Go up to your room and get settled in. Then head for the con bar and study your programme. Don't be worried if you don't drink anything alcoholic – no-one at a con cares two hoots what you drink so long as you don't fall over! Drunkenness is just about the only no-no.

Those helpful stewards

In the bar you'll see lots of other casually dressed folk – jeans and tee-shirt or a SF costume are the norm by the way – and just about all those people will be only to happy to chat with you and help you.

Especially helpful at all times will be the stewards, who usually wear red badges, are the 'gofers' and are experienced con-goers. So never be afraid to say hello or to ask if you're unsure.

On the programme the first night there will be the opening ceremony where the committee will show themselves, and you'll get your first look at the guest(s) of honour, and often, a newcomers party. This is for you. Here will be some regular con attenders, committee and often, the guests, and they're all ready and very willing to welcome you to fandom. So go along and *talk to people.*

After this you might want to sit in the bar, chatting with new friends and playing 'spot the costume', or catch some of the films or videos which might be showing. On Saturday and Sunday there'll be plenty more films to see, plus talks by the guests and the auction during the day.

Guest talks are your chance to hear what the guest has to say and often ask questions – so once again don't be afraid to open your mouth.

Boost for charity

At the auction, there'll be all sorts of goods on sale, from fanzines to a nail from the Enterprise bridge set! Some items are donated so any money they make goes to charity, and on other items the charity gets ten percent.

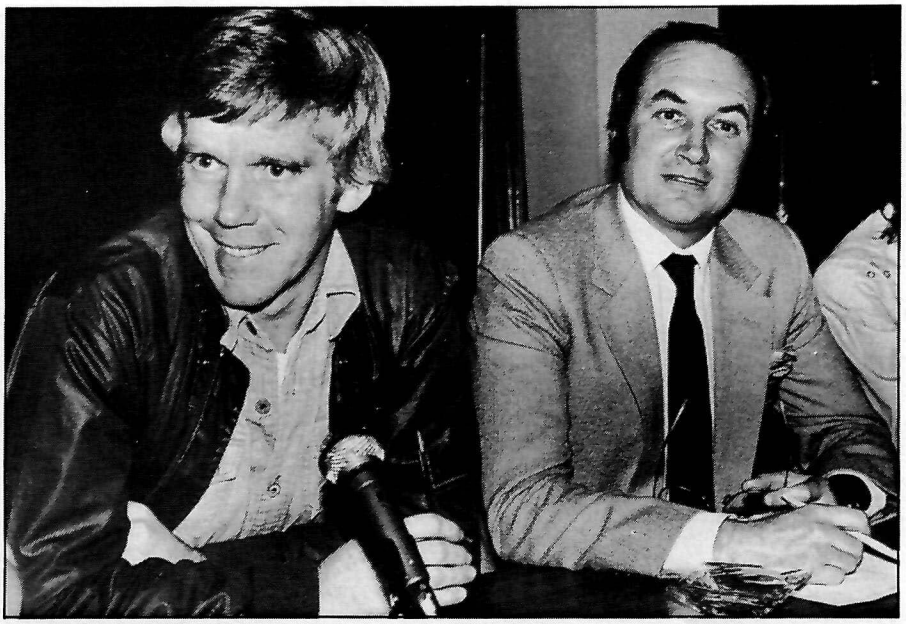
Come the evening there'll be a disco, with possibly a drama or fancy dress contest. These are worth seeing for the standard of the costumes, and the ingenuity of the narrations and scripts.

Also at night, as you walk round the hotel, you might suddenly find yourself in the middle of what seems to be all out war – with phasers and other weapons firing full blast. This is a Hunt.

Hunts used to be frowned on by convention committees but are gaining acceptance as they find that those organising the hunts are sensible and responsible. What usually happens is that a group of regular con-goers challenge the *Trekkie Assassination Squad* to a battle with fake guns and serious make-believe. If you like the idea of two hours of grown-up cowboys and injuns ask any TAS, STAB (*Star Trek Assassination Bureau*) or TASAS (*Trekkie Assassination Squad Assassination Squad!*) member for details and you'll be paired with a veteran.

It's hard work but good fun and your friends back home will never believe you!

The convention's guests of honour will be wandering round the hotel the whole time, and will, I've always found, be absolutely delighted to stop and chat if they can, as well as to sign autographs and have photos taken.



Jeremy (Boba Fett) Bullock and Michael (Vila) Keating at Galacticon '83. Opposite, cast members with host, the Lord of Bath, and Blackpool illuminations at the BBC's Dr. Who 20th Birthday party. Con-goers often wear fancy dress – one of the ladies opposite below is a man! Photos: W. Graham.

Hard-to find books

You'll also have the chance to spend lots of money at the sales room over the con, with sales tables manned by both professional booksellers and amateurs and clubs.

The pro stalls carry lots of books you can't find anywhere else, including ones imported from America, and the amateur ones have fanzines and other trivia.

All too soon, you'll find yourself attending the closing ceremony, with presentation of awards and you'll find yourself with a lump in your throat, sad at being back in the mundane world.

But I'm prepared to bet you'll be going away with the knowledge that you've had a wonderful weekend, have made many new friends, and you'll already have registration forms for more cons in your suitcase.

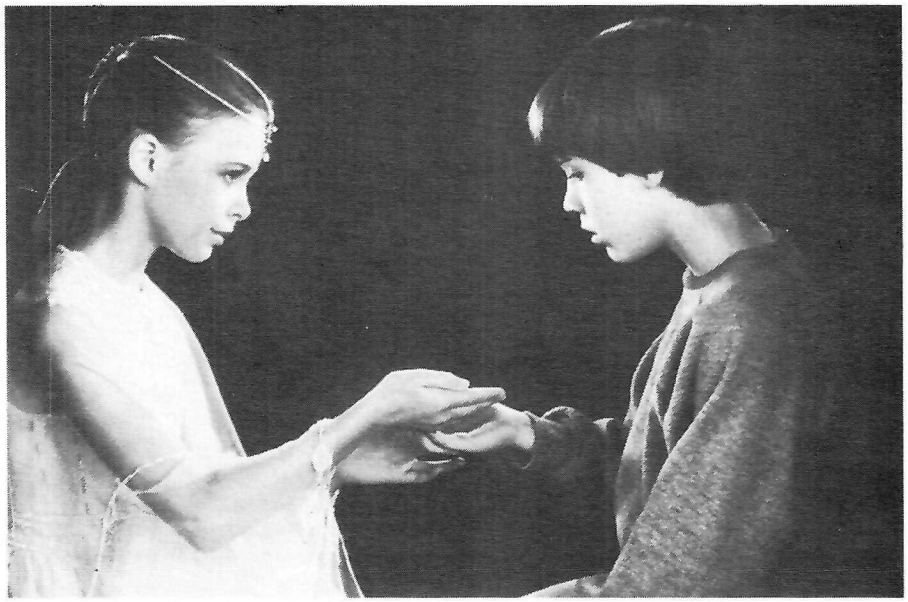
To sum up the mood of a typical convention, I'll close with a conversation overheard between two waitresses at the end of the Trek UFP con in Manchester last May.

First waitress: 'You know they've drunk this hotel just about dry yet no-one got drunk. . .'

Second waitress: 'What do you expect, they're all aliens. . .'

NEVERENDING STORY

AS FAR AS THE MAKERS' PUBLICITY IS CONCERNED, NEVERENDING STORY IS SUPERLATIVES ALL THE WAY, AND WITH A BUDGET OF ABOUT 60 MILLION MARKS IT SHOULD BE SOMETHING SPECIAL, UWE LUSERKE, HOWEVER, BELIEVES THIS GERMAN PRODUCTION MISSED SOMETHING SOMEHOW.



The Empress of Fantasia (Tami Stronach) gives Bastian (Barret Oliver) a grain of sand, from which to rebuild the magical land.

Sympathisers have called it 'the ultimate fantasy movie' and the production team has been hailed as 'the best in the world'. The names involved are quite impressive. Producers Bernd Eichinger and Dieter Geissler; director Wolfgang Petersen (*Das Boot*) – Oscar nominee last year, special-effects supervisor Brian Johnson (*Space 1999, Alien, The Empire Strikes Back, Dragonslayer*), Makeup supervisor Colin Arthur (*Clash Of The Titans*) and animation boss Stephen Archer (*Krull*).

Critics of the movie talk in superlatives too – 'The greatest flop in German film history', 'the final killing of a great book', or 'the most chaotic production ever' . . .

At least one superlative will not be disputed: Rarely has there been such a lot of secretiveness during the shooting of a movie.

Nobody was allowed to let out a scrap of information before the start. A trailer for the start of the movie showed only the outside of the studios! In the cutting rooms every evening the wastepaper baskets were emptied and the contents destroyed.

When viewing the finished product now and keeping in mind all the ballyhoo and expense, one cannot help but feel disappointed: *The Neverending Story* is not what it could – and should – have been.

Instead it has been cut down to Disney-level: acting is not bad; special effects go from fine to mediocre to bad; and editing is the worst to be seen for quite a while. One cannot help feeling that more could have been done with less money . . .

How it all began . . .

Early in 1981 somebody gave a copy of Ende's novel to producer Dieter Geissler. 'I was fascinated by that story. But at the same time I was terrified, thinking of how to translate it visually,' he said.

He visited Ende in his big house near Rome that summer, and after a ten-hour discussion they drew up a contract, stipulating that Ende was to write the screenplay and that his script could not be altered without consent.

They planned a 'cheap' movie costing about 7 million Marks, at least partly in High-Definition TV-technique. Ende wanted it done with painted backgrounds, looking mysterious and 'booky' and using only a minimum of special effects. But then the book entered the best-seller lists and Geissler began to see it as a high-budget production of more than 20 million Marks, too much for his own firm, so he sold the contract to Bernd Eichinger of Neue Constantin Production. Eichinger wanted to aim this movie at the US-audiences, and enlisted Warner/Columbia.

Pre-production work was begun in Spring 1982 with Helmut Dietl as director. He worked on the script, Ende and Eichinger did not agree and in October Dietl quit. Now Ende wanted to stop the project, but Eichinger convinced him to go on – with the new director Wolfgang Petersen. Petersen and Ende worked on the screenplay and finished it in December. But now Eichinger didn't like it . . .

Eichinger went to the USA again with 'Creative Consultant' Herman Weigel – also a script writer. Weigel told the story so well that Eichinger at once had him rewrite the script. The finishing touches were given by US-writer John Hill.

In February 1983 Ende was surprised to learn about this new shooting script through a close friend. Nobody had told him . . .

Ende objected to the new script. But Eichinger didn't yield. Ende and his publisher could have sued to halt the project but after some conferences (and legal quarreling by lawyers) they decided against lengthy and expensive legal action. Ende decided to remove his name from the film, and released a statement to the effect that *The Neverending Story* was being filmed without his approval. On March 14 shooting began, to be finished in September.

The Story

The film begins in a small midwestern American town. Ten years old Bastian escapes from three bullies into a small second-hand bookshop. Bastian is fascinated by a big old book which he steals.

The book describes the land of Fantasia, which was built from the dreams and imaginings of all people. But Fantasia is in grave

danger. Nothingness, chaos, or whatever you'd like to call it is slowly eating the land. Creatures of every kind send messengers to the child-like Empress to see what she can do about it. But she is ill – chaos is robbing her of her life energy. There may still be hope, though. A boy named Atreyu, a 'child of nature', is given the Empress's amulet to protect and lead him.

The brainchild that ran away

Why did Michael Ende disown the movie? 'Of course I knew that the book could not really be filmed. I changed it – had to – to make it filmable. I wrote several new scenes in which are still in the movie. I wasn't eager to have my book filmed, but the filmmakers talked with angel's tongues and declared they wanted to make a movie that, to my mind, I could fully approve of.'

Then the contract was sold and the script rewritten to an extent Ende could not bear any longer. 'The script no longer captures the substance of my novel. Left over are only some images, locations and characters, which have been robbed of all meaning and context. The problems inherent in making a film out of the book have been solved simply by eliminating the reasons for the problems, and in the process all depth, meaning and artistic seriousness.'

When script-writer Herman Weigel was asked if Ende had known from the beginning what the movie would look like, he said: 'Sure! And he thought it was great! I think Ende has developed away from the film and not the other way around. The book has become a cult book and Ende a guru . . .' When I told Ende about Weigel's opinion, he laughed and replied: 'I did not develop away from the film – I developed away from the big money! Big money in a movie production means technical perfection. Imagination is killed by that perfection – it leaves nothing for the imagination to work upon . . . They made it a teenager movie – pure Disney stuff.'

There are a lot of examples for what Ende means by that. Some of the creatures look far too cute in the movie – for instance Fucher, the luckdragon just looks like an overgrown teddybear and at the end of the film Bastian has not learned anything – all he wants is to take a joyride on his tame dragon. In the book, when Phantasia has been annihilated, Bastian has to build a new Phantasia all by himself and in the process he learns a lot about himself. In the movie, after he gives the Empress her new name, the old Phantasia simply exists again – bang. Bastian's inner growing has not taken place – he is also the same as before (and that is not the fat little dreaming misfit of the book).

Ende is right when saying that instead of conveying a meaning the film is simply a catalogue of adventures. Of course, there should have been a second film, because *The Neverending Story* only shows the first half of the book. A second movie was planned, but this Ende could prevent. In his contract only 'the movie' is mentioned, and not two movies. So this is a matter for lawyers.

The Makers

Producer Bernd Eichinger is at 35 years one of the youngest in the top group of European film producers. A tall, skinny man in denims and sports shoes, he hates luxury, dolce vita. He lives simply and works hard and is fascinated

Atreyu (Noah Hathaway) with his horse Artax as they begin their quest to save the magical land of Fantasia.

by movies. On *The Neverending Story* he said: 'It's a story about all that which we find inside ourselves – fears and hopes, dreams and wishes. This subject almost wants to be filmed. But great subjects also bear great risks.'

Eichinger admits that at first he thought of a 30-million Mark budget. But the project grew and he was not sure that he could find the funds. He put 15 million Marks in from his own firm. The rest had to be found in the USA . . . And he took the additional risk of offering his US-partners a German director.

He had an agreement with Disney and then their management changed and they wanted him to wait for six months. So he went to Warner/Columbia and there the same thing seemed to happen. But finally Warner/Columbia took up the challenge. A greater personal problem for Eichinger was the quarrel with Ende, who called him an 'unscrupulous finance-shark with Hollywood manners'. This is something that made Eichinger swallow hard. Long after he was still feeling insulted.

'Up to now I never made a difference between what I deem valuable in a commercial sense and valuable on the cultural level. If I look at movie history I see that the most important movies for directors and authors and producers were also the commercially most successful. Well, there sometimes are exceptions . . .' That is ambiguous, of course and rather seems to agree with what Ende said about him.

When Wolfgang Petersen took over the directorship he came into a kind of chaos. Apart from the special effects people nobody had any experience in doing a fantasty film. Pre-production work was disorganised, designs were changed constantly, there weren't enough preproduction paintings. They hired an artist David Hardy to do scene paintings working from the designs of Ul De Rico, but then had him only do four paintings. People were fired and hired every week. Even the leading team had difficulties of cooperation.

'In the beginning Bernd Eichinger, Herman Weigel and I almost beat each other up – we had enormous difficulties getting along and with the script . . . But then it improved and we became a real team.'

There were lots of problems which could only be solved at the last moment. They found the actor for Bastian exactly two weeks before he had to begin shooting and Tami Stronach just one week before.

Said Petersen: 'One of the first people I showed this film to was Steven Spielberg. He told me that this was something absolutely new: the subject matter as well as the production technique. He calculated that the same film would have cost about $45 m in the USA. Take for instance the visual conception of chaos – nothingness. In literature it's fairly easy. We took the largest tank available – developed in US-studios to produce artificial clouds – and experimented with it for almost a year . . .'

Petersen thinks that *The Neverending Story* is his most personal movie yet. His next will be a Science Fiction one: *Enemy Mine.*

The Actors

Apart from a few small roles – either as humans or as creatures of Fantasia – *The Neverending Story* concentrates on three main characters: two boys and one girl.

These principal roles went to American actors, who are easier to accept as identification figures for teenagers in the states.

For shy, timid Bastian the producers found Barret Oliver. Barret is a child-actor, who has already done more than a dozen movies and who often seems to be slightly overacting, but when the shots are developed they come out just right. His strength is an absolutely charming kind of naivité.

The second male role – Atreyu – is played by another well-known child-actor: Noah Hathaway from Los Angeles. Noah is an absolute professional. Among the movies he made before, are *It's My Turn* (with Jill Claybourgh) and *Best Friends* (with Burt Reynolds and Goldie Hawn), but here he is best known for his role in the series *Battlestar Galactica.* In *The Neverending Story* his was the most difficult and exhausting role: he had to do lots of stunts himself and he did everything with a professionalism which is rare in such a young actor. (Maybe too much – for in the end he lacks the charm of his co-actors.)

The most difficult role to fill was that of the childlike Empress, described in the script as 'of no fixed age, mysterious, a small girl with the eyes of an oriental. She makes us believe in her as both – child and empress.' For this they finally found Tami Stronach in San Francisco in an acting school for children. 'When I acted I completely forgot that I'm Tami Stronach from Berkeley – I was in Fantasia,' she said.

Tami was born in Teheran on July 31, 1972, later lived in Israel and came to the USA in1980. Her father and her (Israeli) mother are both archeologists. No wonder that Tami still does not feel 'American'. 'I'm international!' she says.

A bagful of tricks

The Neverending Story – robbed of part of its literary sense – largely depends on tricks and animated figures for impressing the audiences. So the producers decided to hire a two Oscar winner for special effects, Brian Johnson. Johnson has worked on films like *2001 – A Space Odyssey, Alien, Dragonslayer, The Empire Strikes Back.*

'In Germany no specialists for that kind of work could be found. Everybody had to learn,' he said. 'The Germans learned quite fast. Still it was necessary to bring over my own specialists for remote control, servo-motors or hydraulics.'

When Johnson and his crew began to work on pre-production, they realised that they would have to do a lot of blue-screen work. So the largest blue-screen-wall in the world was built for the Munich Bavaria studios. Three camera teams and about 250 people were working there. Johnson used computers to control camera movement. And then they used a very old kind of Vistavision camera.

'We had to find them first. In Italy we bought four and from them we built two which we could use. They pose a problem for the camera-man. He cannot look through a viewfinder to see what he is shooting. Those Vistavision monsters are not being built any more. But for us they were absolutely necessary. With them the film does not run through vertically but horizontally so the negative is twice as wide as usual.'

Huge masses of material and special equipment were used to create for example, the Marshes of Sadness. One set was completely converted into a swamp. Several trucks brought tons of peat and turf, which were watered profusely, dead trees and artificial fog were added and lo, they had the depressing views wanted.

When Atreyu is going through the Marshes his horse Artax has to submerge slowly. For seven weeks the horse was trained to walk into deep water and submerge until only nose and eyes showed. But the set looked so realistic that the horse was frightened, Noah was thrown off and injured. Finally the animal was settled and shooting succeeded.

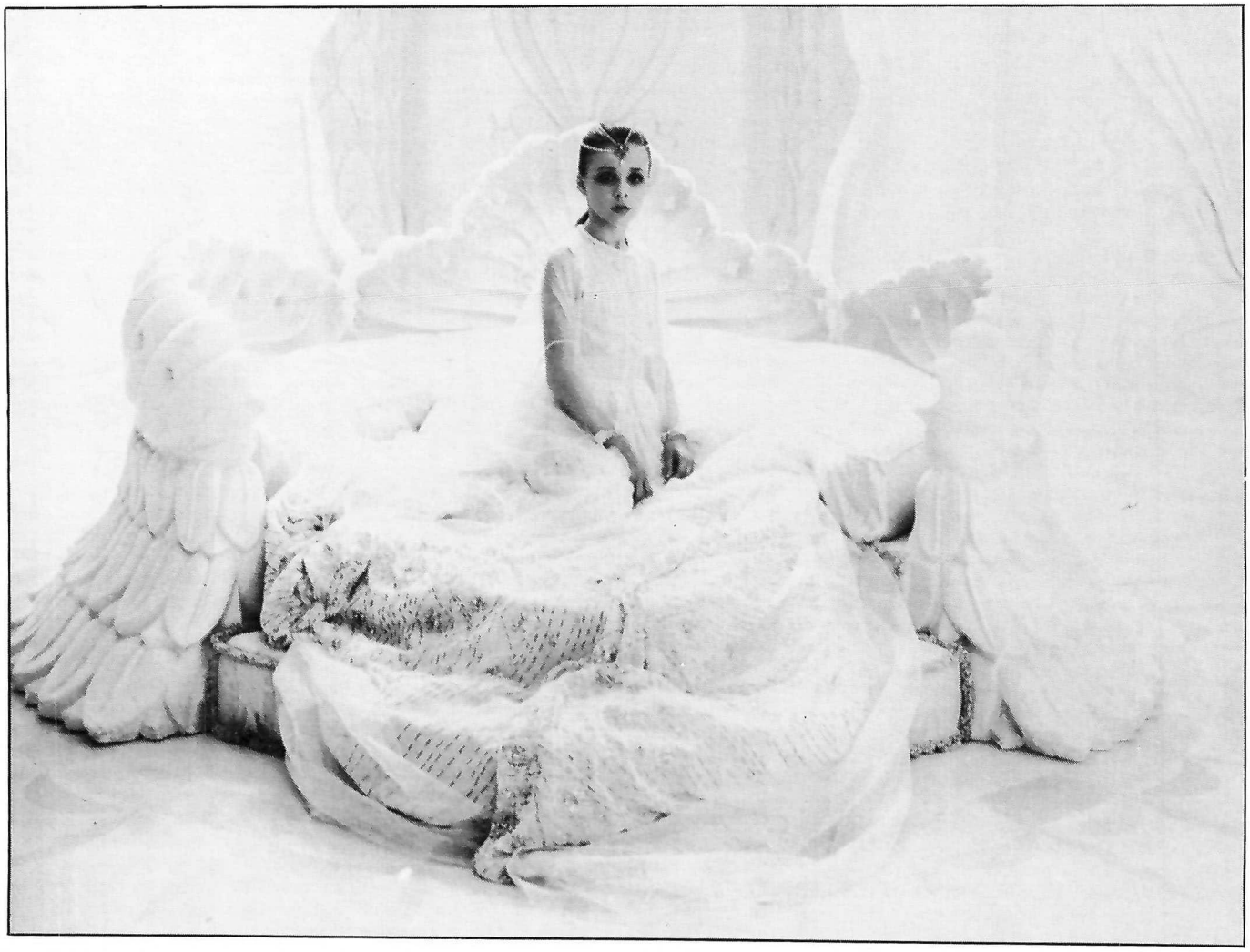
Fuchur, the luckdragon, is almost 15 metres long and weighs 1,000 pounds. The neck alone measures three metres, and has to carry Atreyu in addition to its own weight when moving! Engineer Guiseppe Tortora built in several electro-engines to move this huge body. The dragon-skeleton was made from steel used in aircraft-construction and held by springs as thick as a finger. Then, when all was finally functioning, the plastic scales on the 'dragonskin' melted in the heat of the spotlights. It took 50 hours of work to remove and replace them with a heat-resistant material.

A small-scale (40 centimetres long) model of Fuchur for the flying scenes doesn't convince! The movements are okay, but the model looks like a cloth puppet with completely limp legs.

The 42 creatures of Fantasia, were not all so complicated as Fuchur, but still involved lots of work. Colin Arthur not only did the complicated makeups, but also sculptured small clay-models of the creatures artist Ul De Rico had designed. When the team was satisfied with the small models, big plaster ones were built using more than 50 tons of plaster. Negative forms were cast from those, and finally liquid plastic formed the final 'bodies'. Animatronics-engineer Joe Brayda then put in the necessary electronic equipment, so the creatures could be moved in several ways. Fucher for instance could be moved in 20 different ways. The miniatures for certain shots were designed and built by Francis Coates.

German film-architect Rolf Zehetbauer (*Cabaret, Das Boot*) built the sets. His problem was to have the final shots look as if done in a natural landscape, to bring depth and a feeling of distance in. Only one problem Zehetbauer was not able to solve himself. They had had to use real branches and whole trees and without their knowledge brought in a lot of bug-larvae. The little animals must have believed it was

The Empress searches for an earthling with the courage to do what he dreams in order to save her magical kingdom from the ravages of The Nothing.



summer in the studio heat, and so they hatched and soon the set was filled with the little vermin which began to eat the sets – so Zehetbauer had to find a vermin-catcher.

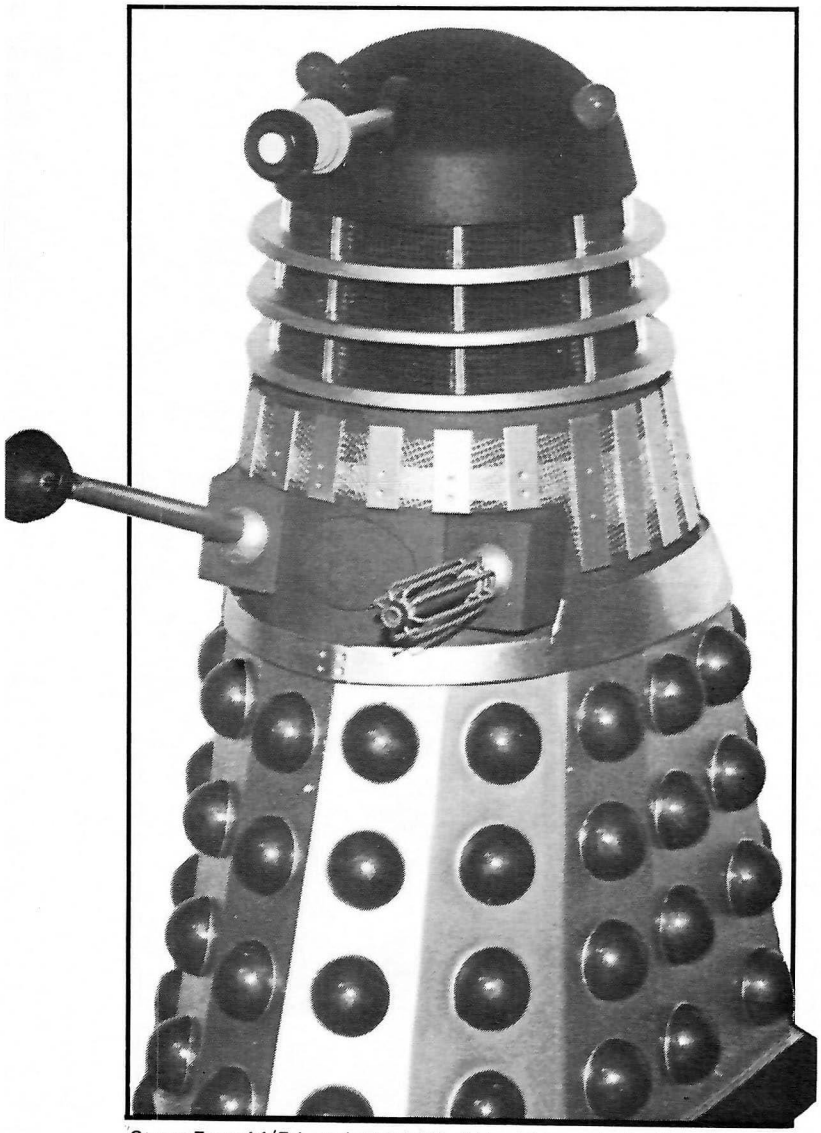
To see how all the tricks looked Eichinger hired Uwe Bendixen – a video specialist. He filmed everything and Petersen and the team could then check the latest shots at once. This way of doing it is still new.

A final number: During the shooting the film crew drank about 252,000 cups of coffee! Considering the amount of work they had to do, this is absolutely believable. Certainly a lot of money was involved in the filming, but surely it was also – partly at least – a labour of love for those film people. Why then is this movie never completely satisfying? Is it the bad cutting – especailly in the first part? Or is it – as Ende told – the fact that not enough is left to the imagination? Has technical perfection killed the magic? You will have to decide for yourself!

Above, the Teeny Weeny (Deep Roy) comforts his racing snail as they flee from The Nothing, a mysterious force which is destroying the empire of Fantasia. Below, Atreyu struggles to bring Artax through the dismal Swamps of Sadness during their quest to save the land. Photos: Neue Constantin Films/Warner Bros.

54TH MODEL ENGINEER EXHIBITION

THE MODEL ENGINEER EXHIBITION IS THE WORLD'S LARGEST DISPLAY OF TECHNICAL AND MODELLING SKILLS; OVER 50,000 PEOPLE ATTENDED THE SHOW THIS YEAR TO WITNESS ALL SORTS OF MODELS AND NEW PRODUCTS. CHRIS RICHMOND REPORTS ON THE SCIENCE, SF AND FANTASY CONTINGENT.



Stuart Evans' 1/5th scale Dalek Mk. IV *took bronze in the Figures class. The model, standing over a foot tall, is available in kit form and is reckoned by some to be more realistic than the 'real' thing.*

With about 50 entries in the 'space' section, this year's Model Engineer Exhibition (the 54th) showed no great increase in numbers on previous years, but the quality of the entries was definitely up to par. The judges, previous *Voyager* editors Ray Rimell and Mat Irvine, together with Brian Sampson and past MEE winner Paul Holroyd, had a tough task on their hands, choosing the winners.

Eventually, of course, the winners were chosen and were presented with their well-deserved awards on the final day by Lord Romsey, grandson of the late Lord Mountbatten. The results were close, however, with two bronze medals being awarded in both H2 and H4 categories, and a large number of models being either 'commended', 'highly' or 'very highly commended'.

A J Colman, of Totten, Nr Southampton, sailed away with the *Space Voyager Trophy* and two gold medals for his *Icerigger* in class H2 (Media-related SF and Fantasy craft) and *The Derelict* (ruined spaceship) in class H3 (Craft of the builder's own design). Other H2 winners were J D Lane of Spalding who got a silver medal for the *TDA SRIRI 4 SQN (m)*, and bronze medallists, M G Cleaver of Birmingham, for *The Fireball XL5* and Simon Rush from Bakewell, whose *USS Enterprise Mk II* was an object lesson in electrical wiring with scores of illuminated windows. H3 silver and bronze medals went to M L Messent of London for his delicate-looking *Rockrunner*, and N O'Keefe of Brighton for the *Skycycle*.

H4 – the Figures class – saw K J Allum of London gain a deserved gold for the scratchbuilt *Prince Elric of Melniboné*, from the Michael Moorcock books. H P Lovecraft's works proved the inspiration for J G Cadera's cynical *'A Present from R'Lyeh'*. JG, who comes from London, was commended for this humorous figurine, which shows Great Cthulhu rising from his watery tomb in the Pacific, bearing a simple egg-timer in a parody of 'those' tacky sea-side resort gifts. Stuart Evans of Trowbridge got a bronze medal and a quick plug for the excellent 1/5th scale model *Dalek*, which he produces on a commercial basis in kit form from Sevans Models. A second bronze went to C Groves of Haverhill for a scratchbuilt *Warlock*.

The Diorama class, H5, produced more humour, this time from J E Clarke of Gerrard's Cross with his commended *'So That's Where He Went!'*, depicting Darth Vader's Tie-Fighter crashed beside a water-hole after his spectacular exit at the end of *Star Wars*. No gold was awarded in this group, but J A Graham of Bristol collected silver for his dramatically effective *The Dreaming Tower* and a highly commended for his *Sarlacc Pit with Floating Skiff*. Bronze went to R F Stedman of Bourne End for what looked like two aggressive cabbage-patch dolls, *Niblik and Pad (The Powe'Icas)*.

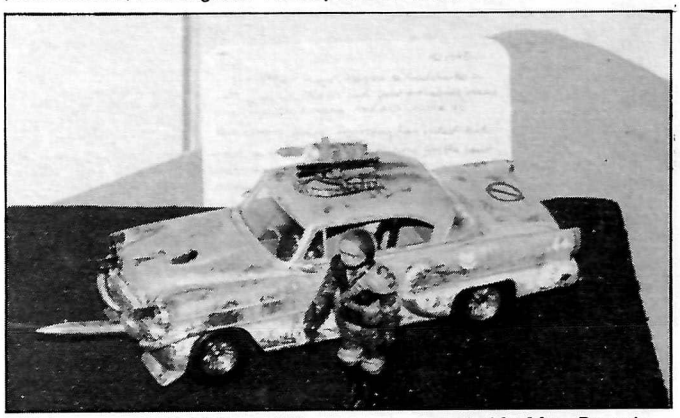
Regular *Space Voyager* contributor, Wendy Ingle of Southend-on-Sea, swept up the top two places in the Cameo class, H6, gaining gold for her *Blake's 7 Federation Trooper* (see *Space Voyager* issue 11) and silver for *Myal Lemyal* (alias Vila, albeit thinly disguised). Bronze in this group went to another amusing subject. *The Vandal*, by C Porter of Edenbridge, featured a skeleton rising from the grave to deface its own tombstone!

Finally comes the Junior class, open to any model from anyone under the age of 16. Again, no gold medal was awarded, but silver went to A

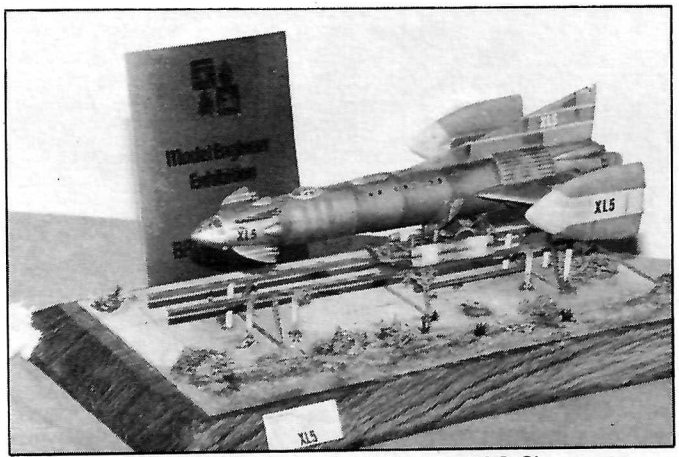
Theobald of Borehamwood for a splendid scratchbuilt *Y-wing Fighter*, and a well deserved bronze was awarded to the youngest competitor this year, Miss R Purser of Plymouth for *Romans Attacked by Monster*. At the age of just 10, Miss Purser can look forward to a great many prizes in the future.

Plans for next years Exhibition are already under way, and entries are accepted up till mid-October. Further details will be announced later in Databank; meanwhile, anyone seeking inspiration for future space and SF modelling projects are advised to consult the special modelling supplements by Mat Irvine in the November and December '84 issues of *Scale Models International*, which give full kit listings, and his article in the April '85 issue of the same magazine. Back issues of *SMI* are available for £1.50 each from Infonet (address on p.18).

Dominating the SF competition display at the MEE was this (commended) 3ft tall green Yoda *by N. Blatt of Harrow.*

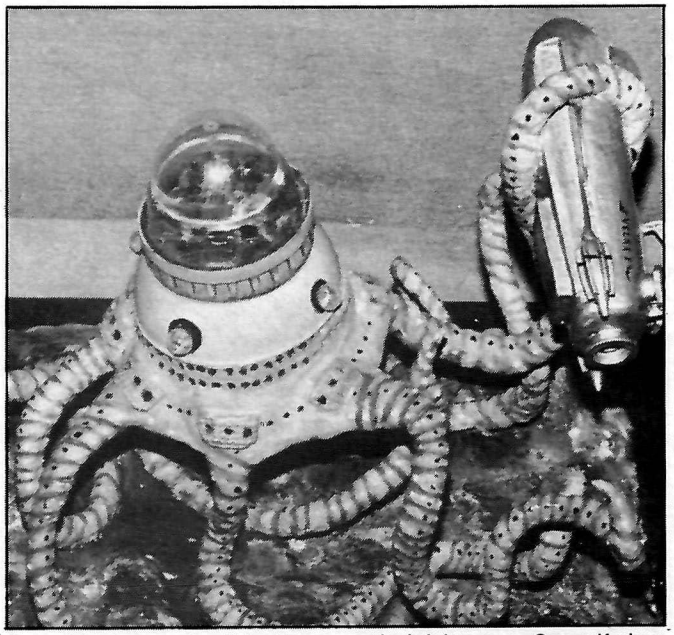


Thirteen year old G. M. Best of Kent was commended for Marx Ruger's Roadshark – Mako *in the junior section.*

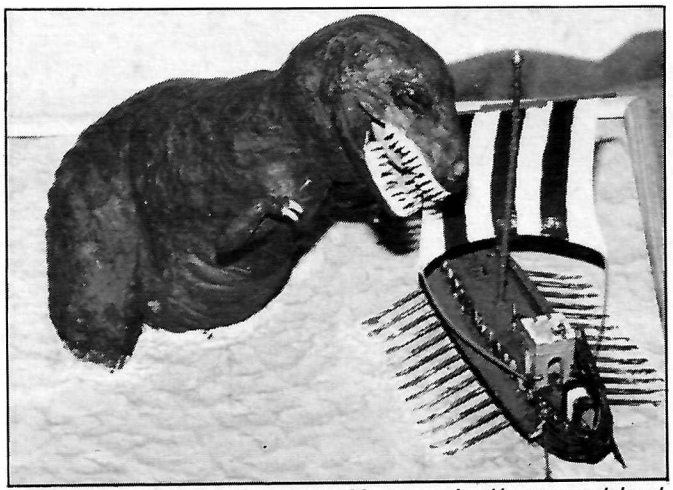


Tying in with this month's Early Anderson feature, M.G. Cleaver was awarded bronze medal for his vacformed Fireball XL5.

Wendy Ingle's gold medal winning Blake's 7 Federation Trooper, *first mentioned in issue 11 of Space Voyager.*



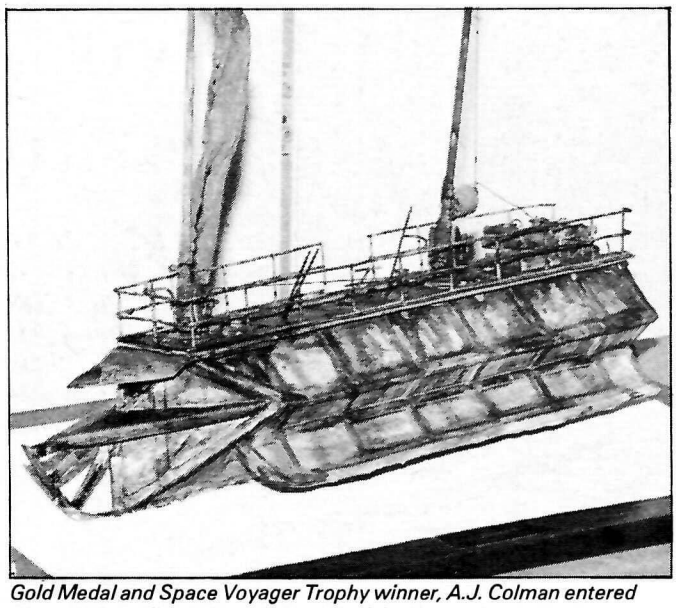
One of the more outlandish entries was the bright orange Space Kraken *by S.V. Carunna of Malta.*



Rachel Purser's Romans Attacked by Monster *gained bronze medal and early recognition for this young modeller.*

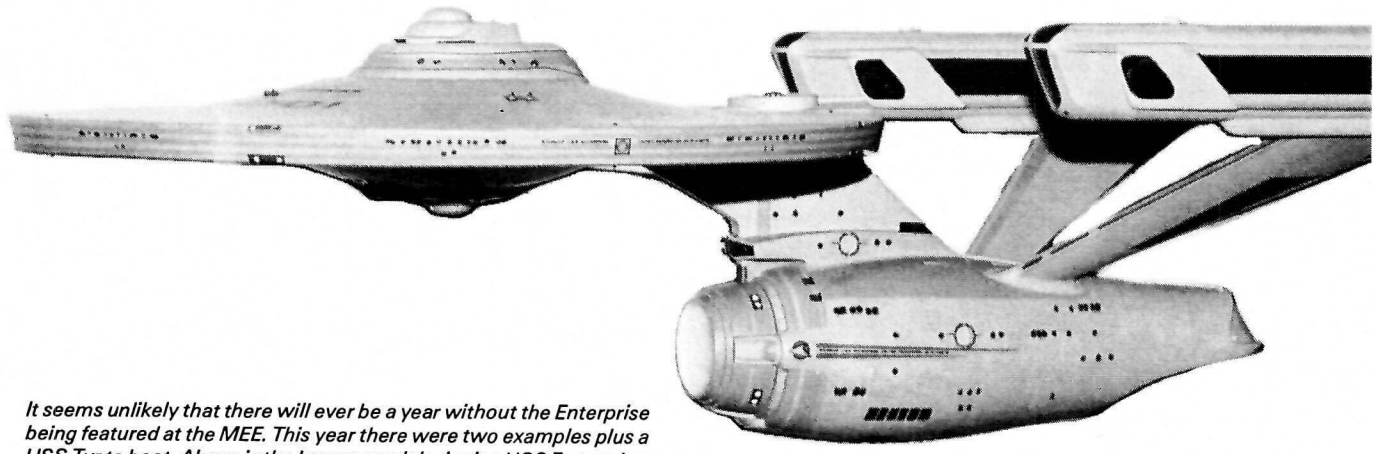
A regular feature at the show is the Space City, *built by Fred Pennicott of Wales. Over 9,500 parts go to make this 15ft long model, which gets bigger every year!* Photo: R. Moulton.

The exquisite Elric of Melniboné, *scratchbuilt from Milliput over a wire frame, won gold for K.J. Allum of London.*



Gold Medal and Space Voyager Trophy winner, A.J. Colman entered three models. His Icerigger *came top of the H2 section.*

Return of the cabbage patch dolls? Niblik and Pad (The Powe' Icas) *gained bronze for R.F. Stedman of Bourne End.*



It seems unlikely that there will ever be a year without the Enterprise being featured at the MEE. This year there were two examples plus a USS Tyr to boot. Above is the bronze medal winning USS Enterprise Constitution 2 Class *by Simon Rush of Bakewell.* Photos: C. Richmond.

EXECUTOR: FLAGSHIP OF THE IMPERIAL FLEET

IN STAR WARS THE IMPERIAL STAR DESTROYERS WERE MENACING, BUT FOR SIZE AND SHEER EVIL GOOD LOOKS THEY WERE OUTCLASSED BY THE SVELT EXECUTOR. CHRISTOPHER FILIPPIDIS BUILDS THE FLAGSHIP FROM SCRATCH.

With the absence of a kit of such a predominant ship, I decided to design and construct my own. My plans and colour-scheme are based on photos and diagrams from the following books: *The Art Of The Empire Strikes Back* and the *Official Collector's Edition book of the Empire Strikes Back.* This was combined with a visit to the local cinema to view the *Star Wars* triple bill.

First the upper and lower hull shapes must be transferred to one sheet of 60/1000" (60 thou) plasticard (these are A4 sized-sheets of plastic available in different thicknesses from most model shops). Using a ruler and a sharp craft-knife, carefully cut out both pieces; also remove the insets in the upper and lower hull halves.

After sanding all edges flat and smooth with a fine grade (P600) – wet 'n' dry, sandpaper, lay the two parts flat onto a sheet of 40/1000" (40 thou) plasticard. Taking a pen or pencil, draw around the two insets (on the inside of the insets) and with a pencil draw a 6 mm border all around the previously drawn shapes again.

Using a craft-knife, remove these enlarged shapes. These will later act as the inset floors upon which you will later add detail. Laying a straight edge along the centre line of each hull-piece in turn, gently score, using a sharp craft-knife, making sure that you do not cut too deeply. If you look at the finished model in the photographs, you will notice that along the side channels (and on the insets) the hull appears to be made of much thinner plastic. Reducing the thickness presents no difficulty, as it is merely achieved by a process known as 'adzing', a technique used widely to achieve an even surface at join-lines. In this case, the blade of a craft-knife is placed on the edge to be thinned and scraped along until the desired thickness is achieved. Repeat this on all edges of the two hull halves, making sure that you only thin the card from the opposite side to that of the scoreline. Be careful not to thin it too much as you may break the outline of the ship.

These 'adzed' edges will be rough, so smooth them as before. Using the surplus 60 thou plasticard, cut out the four support girders and two 2 mm thick strips the length of the two front 'V' shaped walls and again sand the cut edges flat. Cement the girders A, B and D to the opposite side of the scoreline of the upper hull and girder C to the lower, corresponding to the positions shown on the plans.

Flexing the hull halves along the scoreline, so that the girders fit snugly, cement thin strips to the inside of the upper hull about 3 mm in from the outside edge as shown in photograph 1. Taking the upper inset floor, cut it along the line x-x (see plan). Cement to the girders and hull halves the three floors under their respective openings, (see photo 2). Once the girder walls and floors are in place firmly, position the two hull pieces together and cement. You should hold the two halves together with clothes pegs or Sellotape. (see photo 3). The gap which has appeared along the scoreline must now be filled using a suitable model filler such as 'Milliput'. This comes in two sticks which have to be mixed in equal amounts, and which sets hard in about 3 hours. Avoid the single tube types as these often contain a solvent which tends to actually attack the plastic, even if it is made by a modelling company!

Apply the filler along the gap with your fore-finger, making sure that you press it well in (photo 4). Remove the surplus filler with a blade from a craft-knife. Wet 'n' dry the filled line smooth. Once the main superstructure is dry, you can start to add the detail starting with the upper inset. I purchased a small pack of Balsa (most model shops should stock this).

New York skyline

Take one of the pieces of balsa and cut it into small rectangles, and then sand them smooth. Taking these blocks, position them inside the upper inset and arrange them into a 'New York' type skyline. See the plan for the basic outline, which you should adhere to as closely as possible. Once you are satisfied with the arrangement, remove the balsa blocks, noting their positions. Glue the balsa blocks in direct contact with the plastic 'floor' of the ship, in position using 'Superglue'. Do not use balsa glue as it will only appear to stick the wood and plastic and when dry the blocks will fall off. When the bottom layer has been positioned, you can use the cheaper and safer balsa cement to glue the additional layers on top. (photo 4)

I also put two balsa blocks into the underside 'A' shaped inset. Next I laminated the upper surfaces of the balsa with 40 thou plasticard cut into the required shapes and secured with super-glue (photo 5). Only laminate the top surfaces as you can hide the bare balsa by later building on the plastic with small plastic chips and filling in any spaces.

Next comes the tedious part of adding the hundreds of tiny plastic chips to make the various towers and buildings which fill the many insets on the ship.

Taking the remains of the 40 thou plasticard, lightly score parallel lines of varying separation, then turn the card and cut thin strips at right angles to the scored lines. Taking these strips, begin from one end and start bending them along the scorelines. The plastic strips should break to give you small retangular 'chips' of plastic. Continue doing this until you have run out of patience! I made about 500 at a time, and eventually used over 2,000 of these chips.

Using a small artist's paintbrush (not the one supplied with the glue), apply liquid poly on small areas of the laminated balsa and then start placing the chips onto the top inset. As the chips are very small, I found the easiest way to achieve this was by pressing the tip of a sharp craft-knife gently into them and placing them in their required positions (photo 6). Repeat this process in the 'A' shaped inset, along the front walls and in the rear engine area.

Once done, you will immediately see the ship 'come to life'. Continue to add the chips until you are satisfied with the appearance. I don't think that you can add too many, but do remember to keep within the inserts, and not to add any to the smooth surface of the ship's hull.

Drinking straw engines

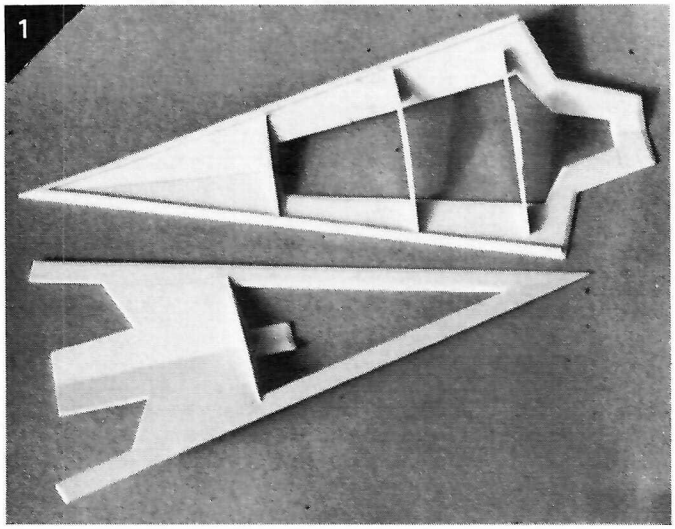
The Executor has a staggering 10 engines, each bigger than five 'Falcons' in diameter. These ten engines consist of two types. One type are simply cylindrical and are referred to as 'Type A' on the plan. The second type 'Type B' are cylindrical but have a heat shield, presumably, to protect the underside of the ship from their immense power.

There are six B-type engines, three placed either side of the four A-type. I made my engines from 'bendy' plastic drinking straws. I chose this type in order to utilise the concertina part for added detail.

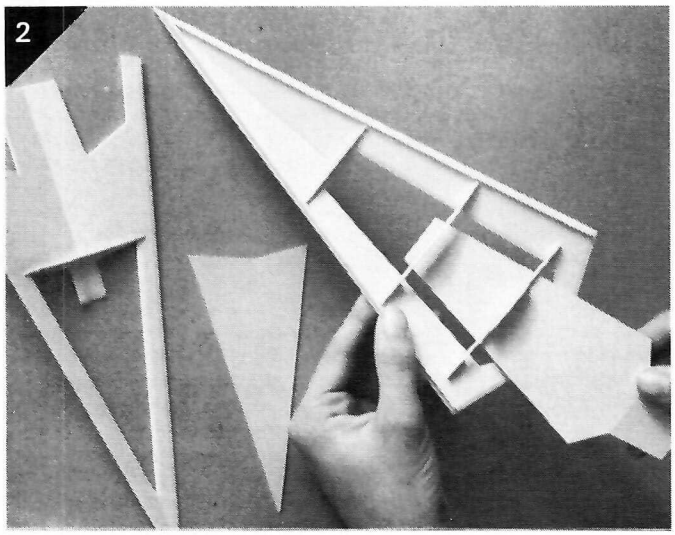
Type A are made by cutting the whole bendy part out and then filling in the tapering section with a ball of Milliput. Type B are made by cutting through the middle of the bendy section and cutting an equal length of the non-bendy part. Then cut the non-bendy part along the axis of the straw and again fill in the cylindrical end.

Secure the engines onto the girders and the underside of the upper hull with Superglue in the positions shown on the plan. I next added some extra detail around the engines in the form of pipes and framework. (photo 8). The pipes etc are made from heat-stretched sprue. (Sprue is the plastic 'tree' which holds the kit parts). Take some sprue and heat it in the middle above a candle flame rotating the sprue in the fingers continually. When the centre turns soft remove the sprue from the flame and pull the two ends apart slowly. The result will be a very thin round rod. Cut this to suitable lengths and cement in place with liquid poly.

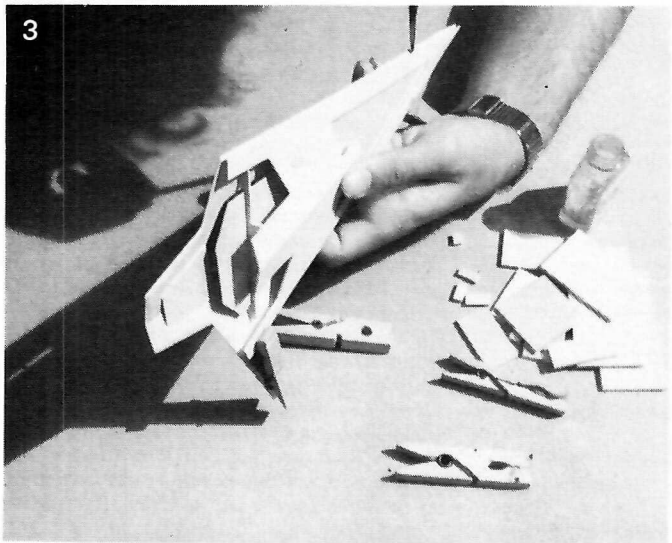
The final part of the assembly is the construction of the conning tower, which I think is the small piece of detail which gives the most effect to the model as a whole and also provides us with an idea of scale for the ship as a whole. The conning tower is made from two pieces of 60 thou plasticard, two



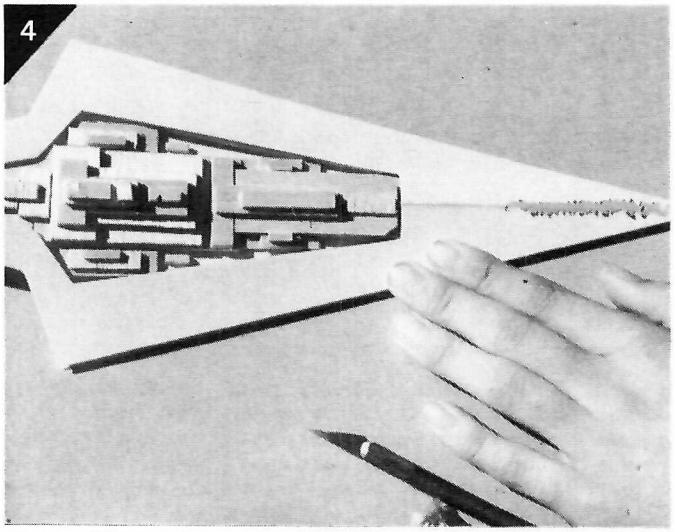
The upper and lower hull halves in the early stages of production, showing the holes for the insets and strengthening girders.



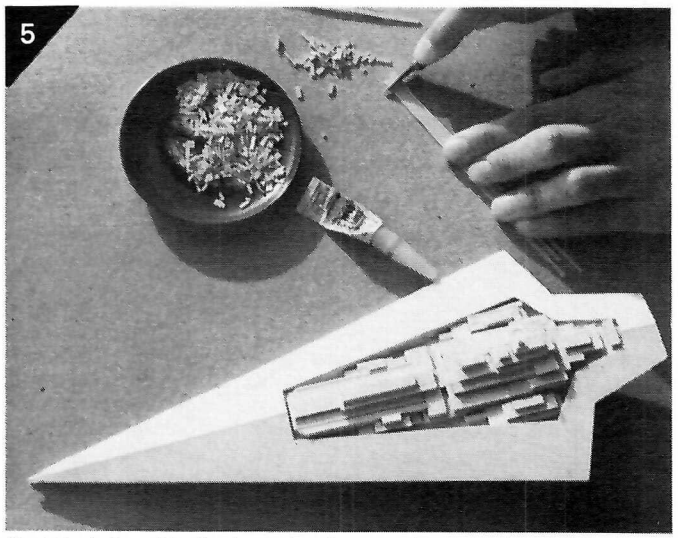
Fitting the inset floors may prove trickier than it looks, so make sure the hull has set completely or you'll be back to square one!



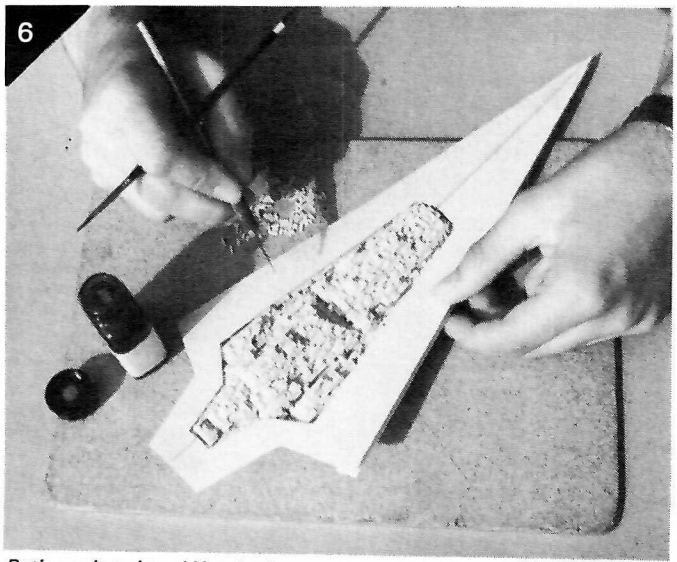
Cement the halves together carefully using Liquid Poly, and clamp them securely with pegs and Sellotape.



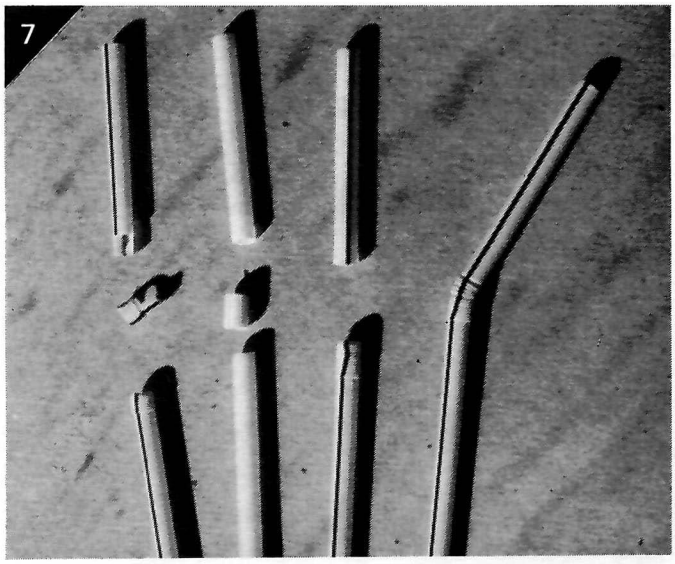
Fill the crease along the hull ridge and add the basic superstructure from slabs of balsa wood.



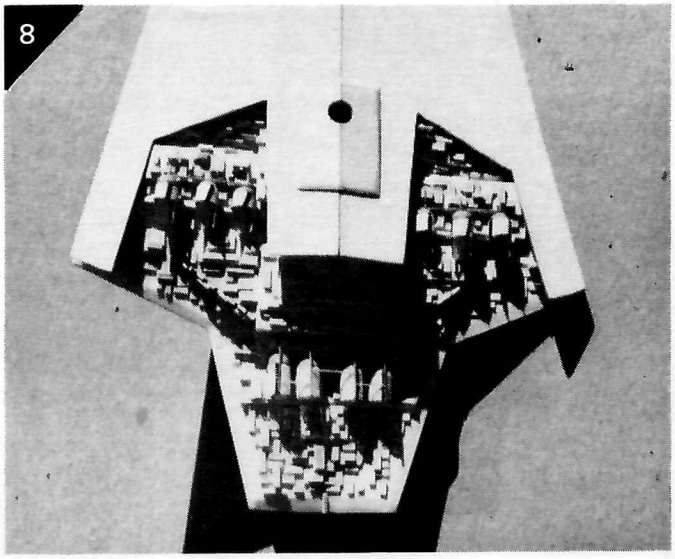
Coat the balsa with plastic card and you can begin cutting up the thin strips for the next, most painstaking, stage.



Patience is a virtue! Hundreds, even thousands of the tiny chips may now be added. Remember – the end product will be worth it!



The bendy-straw engines. Notice the two types of exhaust funnel, cut from the flexible section of these straws.



The underside of the Executor, showing the similar treatment as applied to the top half. The engines are now in place, with stretched sprue girders.

Milliput spheres, and a plasticard sliver to act as a radar.

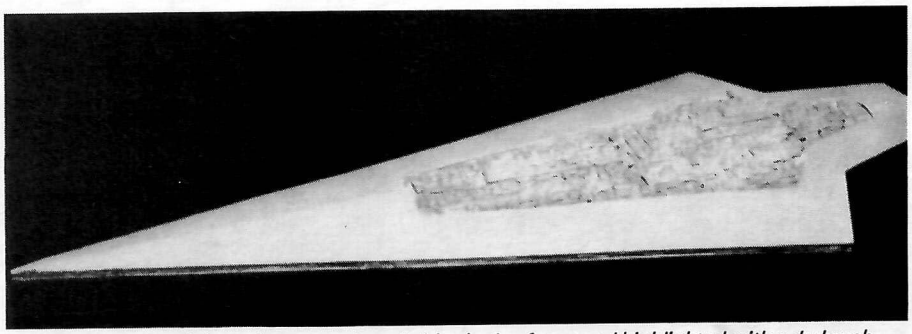
Painting

The complete model really needs to be sprayed so as not to obscure detail. I airbrushed my model with a mixture of Tamiya acrylics using matt white, black and medium blue. Mostly white with a few drops of black and blue. I eventually ended up with a colour not far removed from grey car primer, which you can use if you do not own an airbrush. You may find it difficult to make the acrylic paint adhere to the engines (straws). I eventually used grey enamel.

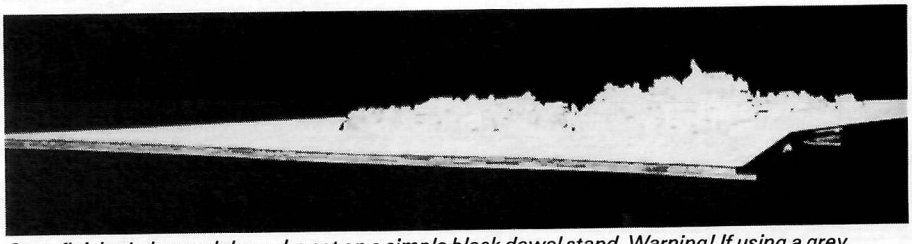
Once completely dry I highlighted the detailed insets, using matt white enamel. Do not use acrylic as this does not dry well. Take a large flat brush and dip it into the white paint then rub most of the paint onto a piece of card. Once most of the paint is removed and you have a 'dry' brush lightly brush over the detail. Any raised edges will then be picked out in white and will enhance the detail a great deal. I then thinned some matt black enamel until I practically had dirty white spirit, and washed over the insets. Capillary action will make the paint run into all the cracks creating a kind of shadow at the base of all the plastic chips. Once this is dry, all that remains is to place your finished model onto a suitable stand.

Nothing elaborate is required just a piece of dowel inserted into a previously drilled hole in a small rectangle of wood and paint it black. Bore a small hole in the position shown using a sharp blade and insert the dowel into the ship securing it with Superglue.

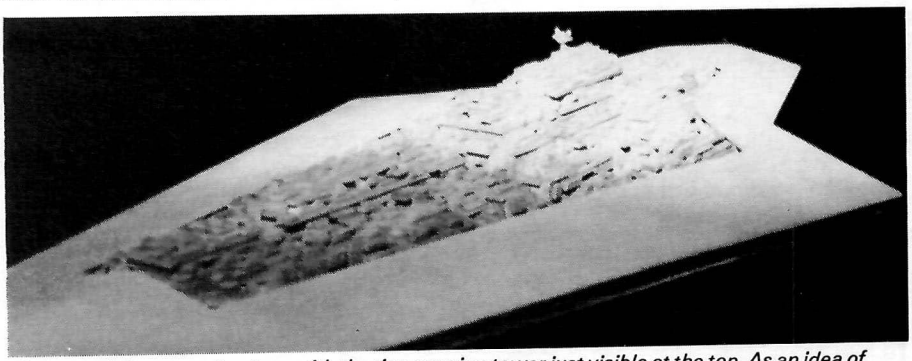
You now have a 1/2000th scale model of Lord Vaders Flagship of The Imperial Fleet. To add an element of scale I constructed a miniature (1/2000th) star-destroyer in much the same way as the Executor and supported it on a piece of wire on the same stand. (If you wish you could put a small Falcon in instead. However, it would be smaller than one of the force-field spheres on the conning tower!).



The completed model may be sprayed a suitable shade of grey and highlighted with a drybrush of white and shaded with a wash of black.



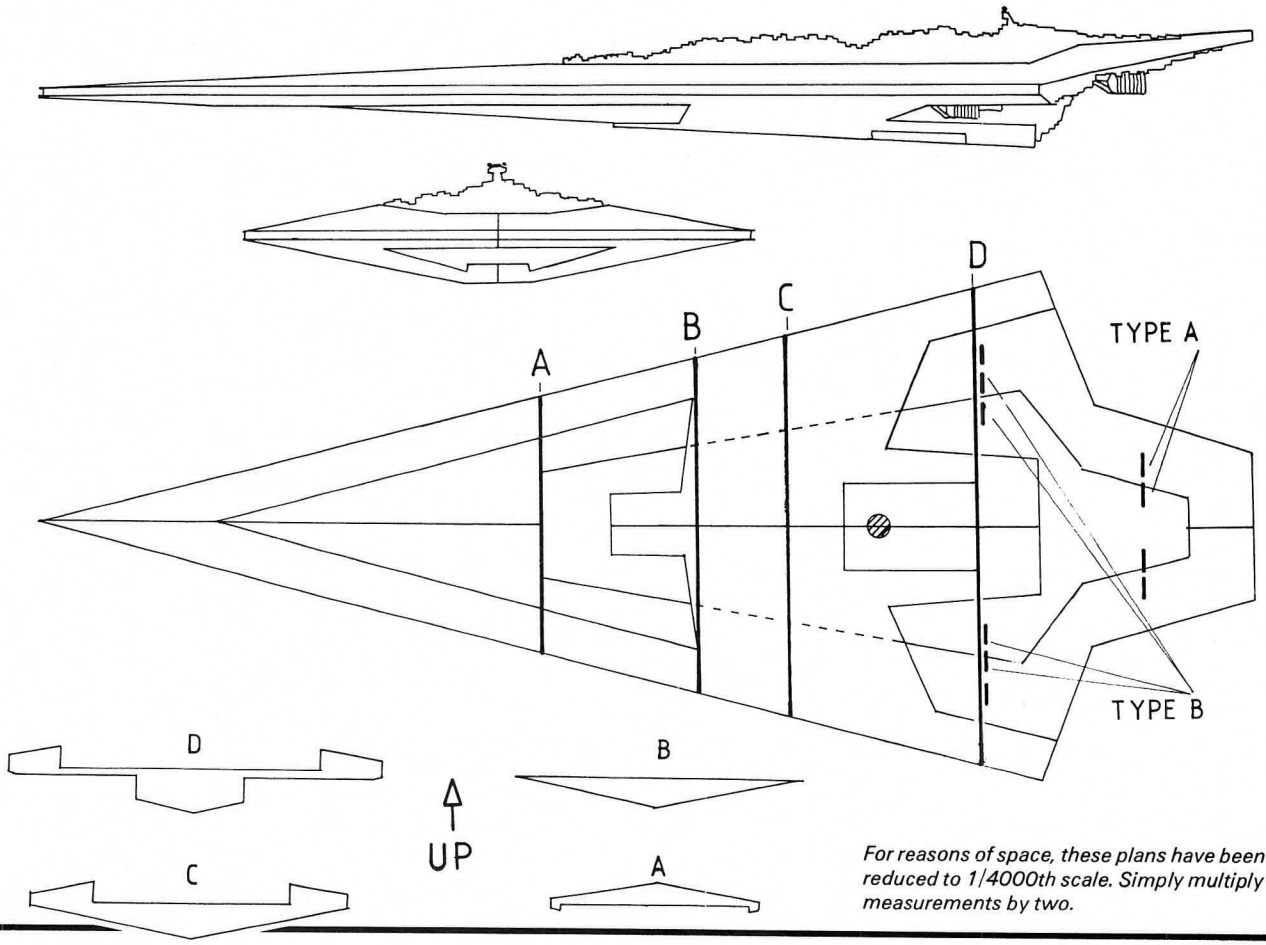
Once finished, the model may be set on a simple black dowel stand. Warning! If using a grey cellulose car primer for a base coat of paint, apply several light coats and allow to dry between each. Too much cellulose at once will melt your model!



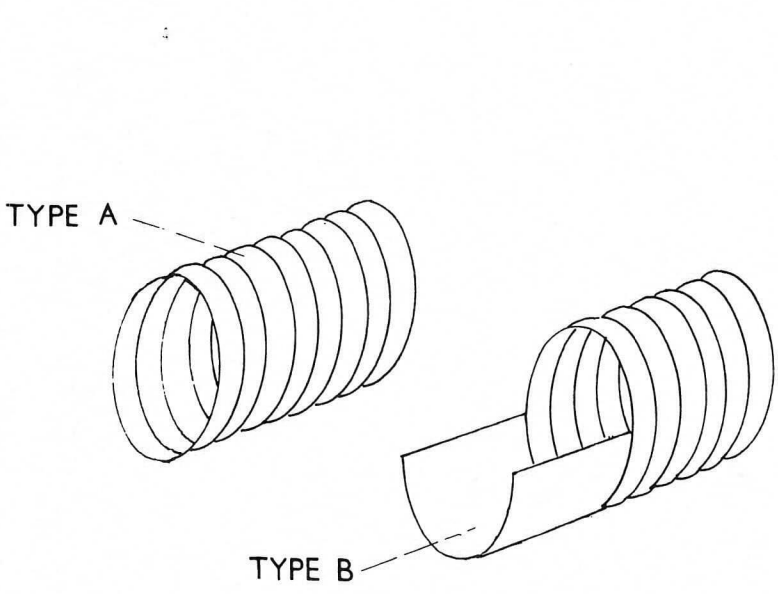
Close-up of the superstructure with the tiny conning tower just visible at the top. As an idea of this ship's true size, the two force-field spheres on the tower are each slightly larger than the Millennium Falcon!

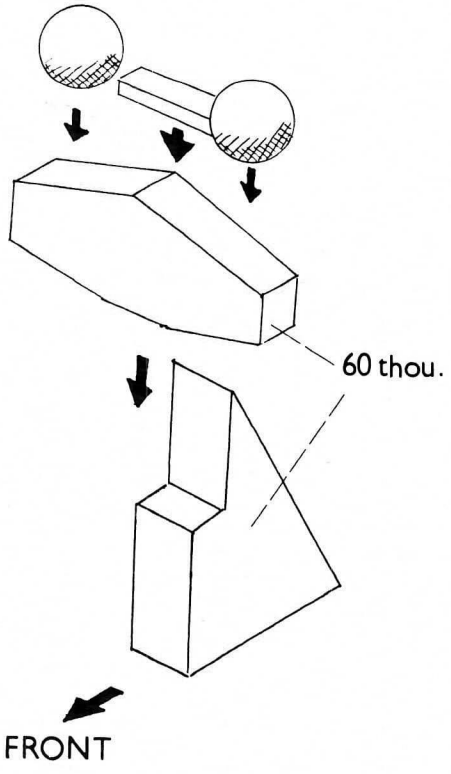
Photos: W. Batey.

THE EXECUTOR SCALE APPROX. 1/4000th.



For reasons of space, these plans have been reduced to 1/4000th scale. Simply multiply all measurements by two.





Above, Type A and B drinking straw engines. Right, the construction of the conning tower. Diagrams: The Author.

PRODUCTS

'Metropolis'. Composed & Produced by Giorgio Moroder. CBS 70252. £5.99.

I've always felt that the concept of "updating" classic motion pictures in order to make the subject matter appeal to a modern audience is very unwise, for two reasons. Firstly, it underestimates both the discernment and intelligence of audiences (who, all too often, prefer the original to the remake – look at the mid-70s remake of *King Kong*, a turkey if ever there was one). Secondly, it implies a horrendous arrogance on the part of the producers and directors – in trying to improve upon the original material, they invariably strip the story of the very things which made it so compelling in the first place: namely, period atmosphere and the popular culture of a bygone era.

The recent 'reconstruction' of Fritz Lang's 1925 masterpiece *Metropolis* presents us with an entirely new problem. This *is* the original version – lovingly re-assembled, re-edited and tinted under the supervision of Giorgio Moroder. And truth to tell, I'd be very grateful for this under any other circumstances; but there's a snag. Giorgio Moroder has added a soundtrack, incorporating the alleged talents of Freddie Mercury, Cycle V, Loverboy, Jon Anderson, Pat Benatar, Adam Ant and Bonnie Tyler.

The result is, without any doubt whatsoever, one of the most execrable soundtracks I have ever had the misfortune to hear.

Giorgio Moroder is something of a legend in certain circles. He's best remembered for his association with disco queen Donna Summer – indeed, it seems that his favourite record is 'Love To Love You, Baby', which is a bit like a dirty phone call except that it's set to music and lasts about fifteen minutes. This reveals quite a lot about Moroder's taste in music and is in itself a very good reason for not letting him loose on a movie like *Metropolis*.

It's too late now, of course. What's done is done, and if you're tin-eared and find disco music stimulating them I'm sure that you'll love this album. If, however, you're genuinely interested in the way that a musical score works in a movie (i.e. to enhance and complement the images on the screen), then I'm fairly certain that you're probably sharp enough to give this record a very wide berth.

I only hope this isn't the start of a new trend. Can you imagine a revival of *The Cabinet Of Dr. Caligari* with musical accompaniment by The Nolans, Barry Manilow and Culture Club? Silence, I am reliably informed, is Golden. What a pity no-one told Giorgio Moroder.

GW

Hitchhiker 25mm white metal figures from Denizen. Price 35p and 42p each.

The Denizen range of Hitchhiker figures have been on the market for some years now, and judging from the samples we've recently received, I'm pleased to say that the moulds appear to have stood the test of time very well. All the castings are clean and almost totally flash-free. As with most Denizen castings I've seen, these figures are detailed without being too intricate – a difficult feature to describe but one which makes them all the easier to paint.

At this stage I should point out that the Hitchhiker range is entirely unconnected with any books, radio or TV series bearing a similar name, and that any similarity between these figures and any characters living or dead for tax reasons is purely coincidental. The range comprises: Hitchhiker in dressing gown, Hitchhiker with satchel, Girl Hitchhiker, Robot Hitchhiker and, of all things, a Hitchhiker with two heads (and three arms).

Seriously though, the figures have all been derived from the TV representations of the appropriate characters, even down to 'Trillian's' hairstyle, except that 'Zaphod' is wearing sunglasses (two pairs, of course) to increase his 'cool'. Painting, as I have said, was simple enough, and our Star Style feature last issue may help with the costume details, particularly for 'Zaphod'. This figure (which costs 7p more than the others – presumably because two heads are better than one) may be enhanced by the purists with the addition of some tiny lengths of fusewire to the jacket for the metallic blue electrical decorations.

In passing, there is another famous figure in the Denizen (Personality) range. Clad in chainmail and carrying a shortsword and what appears to be a peanut butter and jelly sandwich, P6 is a Beagle Adventurer – I'll leave you to guess with which famous character this figure is 'entirely unconnected' – perhaps a WW1 flying helmet and scarf would have been more apt!

CR

1985 Hasselblad calendar from Hasselblad (GB) Ltd. £6.95.

For those of you who don't know, Hasselblad produce the highly sensitive specialist cameras which NASA use in their space missions, and their 1985 calendar is full of the resultant pictures.

It may seem rather late in the year to review a calendar, but here we're willing to make an exception as the value of this particular piece lies in the exquisite photographs it contains, rather than its calendemic (?) nature.

The photo subjects date back as far as the Gemini programme of the '60s, and run chronologically through the months, coming up to date with the Challenger shuttle flight of February, 1984. The shots include views of the Earth, as seen from outer space, and astronauts at work outside the shuttle.

The price of £6.95 includes postage and packing, and the calendar is available direct from Hasselblad (GB) Ltd, York House, Empire Way, Wembley, Middx HA9 0QQ.

CR

'The Adventures of Indiana Jones' by TSR, boxed role-playing game. £9.50.

TSR'S latest Role Playing Game appears to be aimed at those 10-15 year olds who are fans of the films.

What you get for your money is: a rule book, a character and 'evidence' file, a referee's screen, two ten-sided dice, a map of the world, and two sheets of cut-outs for figures and scenery.

The rule book is quite interesting and contains plenty of photographs (stills) from the films. There are also far too many words ending in the superscript 'TM' or '(c) LFL 1983'. The players are given the rules in easy stages in a rather interesting (?) way; the referee reads to the player(s) what can best be described as a short story and when it comes to the crunch he asks 'what do you do now?'. The main criticism that we encountered at this point was that the players seem to muddle through no matter how badly they fail their saving rolls according to the scenarios. It was also felt by the playtesters that it was unlikely that a ten-year-old would bother with short story parts at all. One good part, however, which may interest experienced gamers is that the combat system is, for once, not based on Dungeons and Dragons. (It seems to be related to Runequest.)

The two sheets of cut-outs are certainly a good idea. They allow the players to create a limited 3D dungeon scene and there are enough figures for a fair number of people to take part. The figures are in the form of triangular pillars and can be thought of as an improved version of Steve Jackson's Cardboard Heroes. Most of the main characters from the films are included as well as a reasonable supply of non-player characters (NPC's) referred to as Nazis, Natives, and 'Goons'.

Everything you need to start playing this game apart from pencil, paper, and imagination comes in the one box. Hopefully, by the time you read this there should be two pre-generated scenarios on the market though if they are anything like the ones that come with the game I would have serious reservations about recommending their purchase.

Another point which may deter older players is that Indiana Jones and his companions are 'heroes' and always come out on top. It is, therefore, most unlikely that a player character will get killed off

PRODUCTS

during a game. This, we felt, took something of the challenge away. Since this is an American game designed for American children, English players may find the choice of words in parts of the rule book somewhat amusing.

In spite of all this griping, I must say that this could be a good game for young teenagers who are interested in Role Playing Games but, who are daunted by the cost or seeming complexity of the more well known RPG's. As a final word I would just like to say that although what you get for your money is good value, if you are already happy with the gaming system you already have, then forget this one (unless, of course, you are a devoted fan).

HH

Individual sweaters to your own design, prices from £25 in man-made fibres, Rainbow Designs, Clock House Towers, Railway Street, Southport.

SF fans are a T-shirt manufacturers dream, since they pounce on genre-motified styles to sport as often as they can – but what do you do in the winter?

One possible answer is to get hold of a sweater with your desired logo actually knitted in, and this is something in which the above firm specialises.

Rainbow design will incorporate the wording, design or artwork of your choice into a basically designed sweater, and you have a choice of 40 colours to go for.

The sweater which this new firm submitted to *Space Voyager* for review has the *Voyager* logo knitted into it – and this was chosen to see how well they could incorporate the lettering into the stitches.

They did well, coming up with a recognisable reproduction. The sweater is well made, and washes easily by machine, also, so if you want a unique woolie, then contact them for an estimate. These sorts of sweaters seem to be coming all the rage.

WG

'Star Trek III – The Search For Spock'. Original Motion Picture Soundtrack Composed and Conducted by James Horner. Capitol EJ 2401771. £5.49.

At a time when fantasy film soundtracks tend to be dominated by the soaring strings of symphony orchestras at one end of the scale and the monotonous electronic dirges of ageing rock musicians at the other, James Horner's musical style is both exciting and original. His scores for the *Star Trek* movies have introduced a sense of musical grandeur that was sadly lacking in the TV series, without slavishly imitating the work of composers such as John Williams, who has pretty much cornered the market when it comes to composing soundtracks for science fiction films. Horner's style is much more in the vein of veteran composers such as Franz Waxman and Max Steiner – elegant but robust.

The scores for the *Star Trek* movies have been unusual in that they "borrow" some of the music used in the TV episodes (originally composed by Alexander Courage) – but the pieces are so well chosen and so skilfully adapted that they blend in perfectly with Horner's own music.

Courage's evocative eight-note fanfare from the TV series is used to great effect in the opening track, 'Prologue and Main Title'. But instead of leading in to that dumb, frothy TV signature tune (which I absolutely *loathe*) Horner's music sweeps upwards and really gives one the feeling that this isn't just another space opera, this is something *special*.

The second track, 'Klingons', is a masterly adaptation of more of Courage's TV music. For reasons which escape me, Alexander Courage had a habit of using music which had a vaguely Oriental/Middle Eastern feel to it whenever aliens were involved (witness his music for the dancing scene in the TV episode 'The Menagerie'). This is no exception, but Horner's arrangement is deliciously sinister and very atmospheric. The third track, 'Stealing The Enterprise', also contains some of Courage's music but isn't quite so successful.

First track on Side Two, 'The Mind-Meld', is rather uneventful but is immediately followed by 'Bird Of Prey Decloaks" – a wholly original Horner composition with a predominating rhythm akin to Gustav Holst's 'Mars, The Bringer Of War'. This is pretty hard to follow, since it's definitely the strongest track on Side Two; 'Returning To Vulcan' is next – lots of beautiful orchestration here – and then comes what is probably the weakest track, 'The Katra Ritual'. 'End Titles' – the final track – is a lengthened, more elaborate reworking of the introductory theme, and brings things neatly to a close.

All in all, a remarkable package for soundtrack buffs in general and *Star Trek* aficianados in particular. Well worth a fiver of anybody's money, and thoroughly recommended.

GW

Starfinder home Planetarium, Text by Heather Couper, Program by Ronald Alpiar for BBC model B and Acorn Electron microcomputers from Century Software. Price £12.95

Starfinder is a package aimed at anyone with an interest in astronomy, regardless of how much (or little) they know. Its launch is well timed, with the once in a lifetime passing of Halley's Comet guaranteeing a greater number of people than usual looking spacewards. Starfinder's ability to monitor the comet's progress should be a good selling point.

The package consists of a 144 page book and a tape. Those of you lucky enough to have disk drives will be pleased to know the book tells you how to transfer the program to disk.

The book only sets aside the first chapter to operating the program, it could have gone into more detail. The other nine chapters gives a useful basic knowledge of astronomy. The back pages are a mine of information on further reading, clubs and societies, the dates of every eclipse until the year 2004 and a lot more.

Starfinder's program loads in about 3 minutes. It appears to be simple, but take into consideration the amount of data it can process. The displays are in mode 5 on the BBC micro. This must be due to the memory requirements, but some graphic resolution is lost all the same. When you get to know the program, you can use it to display a graphic simulation of the night sky, seen from anywhere on Earth, at any time in the Twentieth Century. A nice feature is the 'Space probe'. A cross-hair sight that can be moved around the screen using the cursor keys. When the sight is placed over an object, the program tells you the name of the object, its constellation and its position.

It is very nice to see programs and packages of this kind appearing, I hope we see more of them in the future and release the home computer from its 'Programmable video-game' status.

AK

Reviewers this issue:
WG – Wendy Graham
HH – Henry Horsfall
AK – Alistair Kerr
CR – Chris Richmond
GW – Graham Williams

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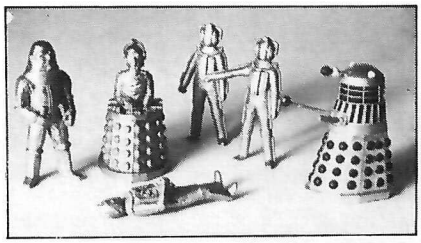

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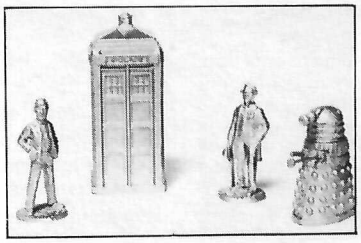

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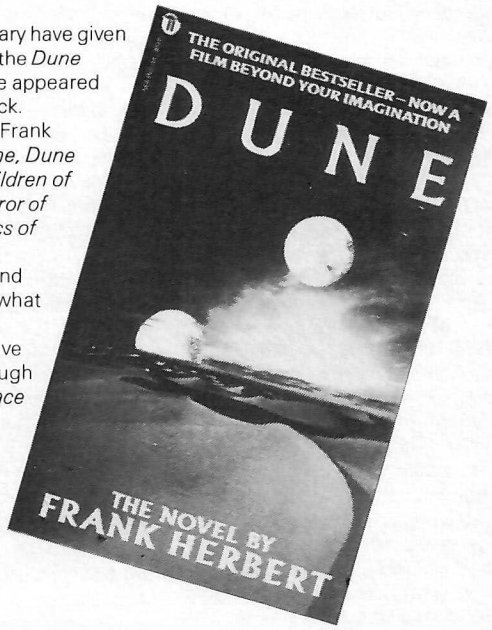
DUNE BOOK COMPETITION

New English Library have given us two sets of all the *Dune* books which have appeared so far in paperback.

The five, all by Frank Herbert, are: *Dune, Dune Messiah, The Children of Dune, God Emperor of Dune* and *Heretics of Dune.*

To win a set (and possibly find out what the film was all about!) all you have to do is read through every word in *Space Voyager* and answer these questions:



1 – Which was Gerry Anderson's first puppet show?
2 – Which 'star' appears in two separate features this issue and is 'mis-cast' in one?
3 – How did the film *Dune* help the author Frank Herbert write the seventh *Dune* book?
4 – Which observatory has been watching Barnard's Star wobble?
5 – Which *Space Voyager* contributors have new books out?

Send your answers, with your name, address and the special clip coupon, to our *new* address on the contents page.

Rules

1. The competition will close on May 1, 1985 and the first two correct entries out of the editorial hat will win the listed books.
2. Each entry must be accompanied by the entrant's name, address and the special coupon cut from this page. Each coupon covers only one entry.
3. Proof of posting will not be accepted as proof of receipt. Whilst every care will be taken, the publishers of *Space Voyager* cannot accept any responsibility for lost entries.
4. The competition is open to all residents of the United Kingdom. The staff of ASP Ltd and their relatives, and *Space Voyager*'s printers, advertisers and contributors, are not eligible for entry.
5. The submission of a competition entry implies acceptance of those rules. The editor's decision is final and no correspondence will be entered into.

DUNE Clip Coupon

READ OUT

'Time Out Of Joint' by Philip K Dick. Published by Penguin at £1.95. Soft covers.

Yet another Phil Dick novel that has been out of print for far too long, this is one book I eagerly snapped up when it returned to the bookshelves. Being a great fan of Dick's work led me to expect this to be yet another masterpiece. However, even the very best of authors have their off periods, and to be honest I would hesitate to group this novel with Dick's finest works.

The story is a little unwieldy and Dick's mode of writing stodgy, both of which go to make it one of those books that is hard to get into. I don't normally have the slightest trouble getting to grips with a Dick novel, but this one really took an effort of willpower just to get beyond the opening chapters.

Bizarre is the word that sums this novel up best. Dick's usual themes are all there as expected, what with parallel time tracks, paranoia and suchlike all present in one degree or another. The story is an interesting one in most respects, and had Dick exercised a little more control over his mode of writing it could have become a masterpiece. Certainly not a bad novel, but not a good one either.

AN

'The Making Of Dune' by Ed Naha. Published by Target at £2.95. Soft covers.

It is fast becoming standard practice for books to be written concerning the production of epic movies, but this latest addition to the ranks does come across as being a little different in many ways. For starters, in comparison to similar fare concerning the *Star Wars* movies, this one is a larger format, with much better printing, and an excellent crop of illustrations and photographs thrown in for good measure.

Ed Naha will be well-known to some readers as a contributor to the American SF magazine *Starlog*. I've always found his writings in that magazine to be entertaining, witty, and always worth reading. His style of writing is a constant one, and so this book comes across in much the same way as his work for *Starlog*. In other words, it's a damn good read.

Naha follows the story behind the *Dune* movie from the very beginning, starting with Frank Herbert's original novel, and progressing through the various projects undertaken to get the work transfered to the screen. That done, the bulk of the book is taken up with insights into the day-to-day filming of both live-action and effects sequences, along with many other aspects too numerous to mention here.

There isn't really much more I can say, as the book speaks pretty much for itself. If you haven't already seen the movie, you might prefer to do so before reading this book. On the other hand, I can't imagine many fans of the movie will need much in the way of urging to go and get the book.

AN

'History Of NASA – America's Voyage To The Stars' by E John and Nancy DeWaard. Published by Bison Books at £11.95. Hardback.

At last! This is a book I've been waiting for a long time indeed. Was it worth the wait? Yes and no. Yes, in that at last someone has put the story of NASA between two covers, and added a large selection of photographs at the same time. No, in that many of the photographs used are so familiar as not to be worth a second glance, and also the quality of reproduction of most is dire.

Getting to grips with the book itself, it begins with a short outline of man's interest in space travel through the ages, then gets down to the formation of NASA in 1958. It follows the Mercury and Gemini projects in considerable depth, jumps to the Apollo missions and the planetary probes, before culminating with Skylab and the Shuttle. Brief mention is also made of the Apollo/Soyuz mission, and the X-15 research aircraft. The text is on the brief side, and skips many important points.

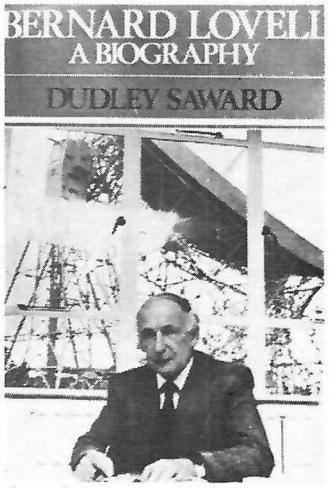
As a history of US spaceflight, the book is satisfactory, but as a history of NASA it falls very short of the mark. Nowhere could I find mention of the many NASA aviation projects, other than a brief piece about the X-15 and an even briefer piece about the X-1. What of NASA's use of the Lockheed U-2 and SR-71 Blackbird? Or the more recent NASA AD-1 slewwing experimental aircraft? These are just examples of small points seemingly overlooked by the authors.

Yes, it's nice to have a history of NASA at last, but surely the authors could have been more thorough in their execution of this book. Like the proverbial curate's egg, it's good in places. Still, it's worth buying, if only as a handy reference book.

AN

'Bernard Lovell – a Biography' by Dudley Saward. Published by Hale at £12.95. Hard covers.

It is always fascinating to read how some of the greats in astronomy got into the field almost by accident. One wonders at such times, on reading books such as this, about Karma, Fate, call it what you will. But it seems as if Sir Bernard Lovell was destined to become the pioneer of radio astronomy and build Jodrell Bank – and that was that what ever he might do.



Sir Bernard's destiny was not clear in his youth, and during his university times he was as much a musician as a scientist – and an ardent cricketer.

Wartime service took him into Radar, especially radar fitted into airplanes, and radio navigation beacons.

After the war Lovell went back into research, accepting a position as Lecturer in Physics at the University of Manchester. He started research into cosmic ray echoes with some radar equipment but soon found that his work was being sabotaged by Manchester's electric tram system, for the trams which passed his lab consistantly swamped his equipment.

The University bursar, when approached about the problem, offered a small parcel of land owned by the University called . . . Jodrell Bank. The rest as they say, is history.

This is a fascinating book. I have only one reservation. Much detail is included about Lovell's early years and his battles to finance the telescope, but more recent times are skimmed. I would have liked to see more detail on discoveries made by the telescope.

WG

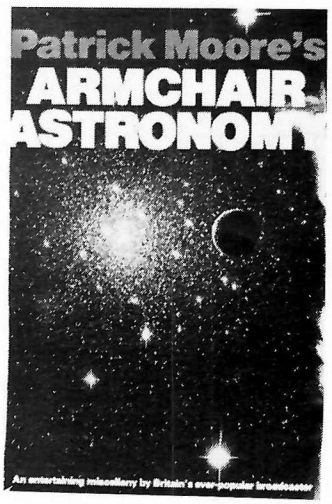
'Armchair Astronomy' by Patrick Moore. Published by Patrick Stephens at £9.95. Hard covers.

This is a real *'can't put down book'*. Patrick has written a series of one page articles on all sorts of things which take his fancy, and illustrated them well. It is a collection of serendipity and is quite delicious.

And when I say *'can't put down'* I mean it. With such short pieces, it is always so easy to find yourself reading *'just one more'* as the clock ticks on . . . and on . . . and on. I started reading this late at night and fell victim to this syndrome, so in one way it is injurious to your health. Warning. Read only in daylight!

Collected between the covers are informational pieces from round the universe, interspersed with anecdotes collected by Patrick over his many years of stargazing, and there is at least one black and white illustration – photo, impression or diagram – on every page. Recommended.

WG



'Stars In My Pocket Like Grains Of Sand'. Samuel R Delany. Bantam Books. $16.95. Hard cover.

If you like your SF to be familiar, with the same old heroes doing the same old things to the same old aliens, nobody existing above the waist, where you know it's the future because people fire lasers instead of .45s, write with stylos instead of biros, and sit on chairoids at deskoids, then you will not enjoy *Stars In My Pocket Like Grains Of Sand*. Don't buy it. It isn't for you.

It is the story of a future universe, with six thousand known inhabited planets on which humans and aliens live together in varying degrees of tension and harmony, and it is the story of two men: Rat Korga, a slave on a distant planet, his brain altered to make him little more than a machine; and Marq Dyeth, an industrial diplomat, well-travelled and supremely civilised from an old and respected family that combines within it both aliens and humans. The galactic economy is based on information, and most people are hooked in to General Information, which gives data on almost everything mentally and instantaneously. When Rat Korga's planet is destroyed by a mysterious alien race he is the only survivor; he also happens to be Marq's 'ideal erotic object' (and vice versa). But when the two men are brought together they come perilously close to destroying a second planet.

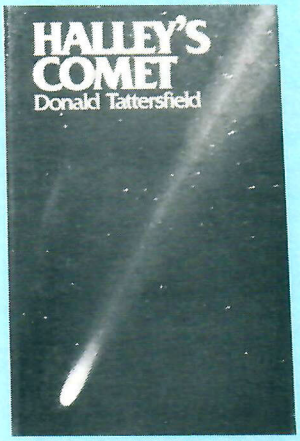
Delany continually uses the book to challenge our preconceptions about civilisation, language and custom, while at the same time offering insights into the nature of subjects as diverse as power and family.

He also tells the first half of a fine and exciting story. Don't allow yourself to be put off by some of the apparent strangenesses of the text (for example, a sentient being is referred to as 'she' – the word 'man' is obsolete) he expects you to *work* at reading it. However, you get out what you put in, and there is a great deal to be gotten out of this book.

NG

'Halley's Comet' by Donald Tattersfield. Published by Blackwell at £6.50. Hard cover.

Here we go, the first of the Comet books to arrive. This one is interesting for two main reasons, one: its price is very reasonable for a hardback and two: if you've got a BBC-b, Spectrum or ZX81 then it has computer programs for you, which enable you to call up the comet's position in relation to



Earth, where to see it, and timings of the full Moon.

It also includes a full history of the comet, theories on comets in general, details on scientific probes going to meet Halley's and all sorts of other bits and pieces.

Some of the technical information is a bit daunting, there are pages with formulae and data sprinkled over them like measles, but on the whole it is easily absorbed and readable.

It also gives, as one of the appendices, details on how to report and claim as your own the discovery of a new comet, nova or supernova, should you come to spot one.

WG

'The Talisman' by Stephen King and Peter Straub. Viking. £9.95.

Stephen King is the best-selling horror writer in the world. Peter Straub is probably the second best-selling, although better known in America than he is over here. So when the two of them collaborate you would expect something pretty unpleasant. And you would be wrong.

The Talisman falls somewhere between *Huckleberry Finn* and *Lord of the Rings*, although it does have its scary moments. It presumes a parallel world to our own, called The Territories, in which certain people have 'Twinners'. Jack Sawyer is a twelve-year-old boy in our own world, whose mother is dying of cancer. An old black man tells Jack that in order to save his mother, and her twinner, the Queen of the Territories, Jack must travel across America to obtain a magical sphere – The Talisman. However, in both worlds Jack's wicked uncle, Morgan Sloat wants both Jack and his mother dead, and Morgan Sloat is very powerful indeed.

Jack's journey takes him through the nastier parts of both worlds – from a forest inhabited by evil trees, to an orphanage run by a sadistic religious maniac, and finally to the Black Hotel where the Talisman is waiting. King and Staub bring their not-inconsiderable talents to bear in order to make Jack's journey as real as possible. The characters, from Jack's friend Wolf, the werewolf, to the relentlessly wicked Morgan Sloat, are so real that you'd recognise them in the street.

The Talisman is a powerful adventure story, impossible to put down, and immensely enjoyable; terrifying, edifying and exciting by turns. It doesn't take a crystal ball to know that it will ride high on the best-seller lists, in hardback and then in paperback, for a couple of years to come.

NG

'Beyond the Black Hole – Stephen Hawking's Universe' by John Boslough. Published by Collins.

This book is a biography of the brilliant cosmologist Stephen Hawking, British, one of the youngest-ever members of the Royal Society, investigator of Black Holes and the Big Bang, and confined to a wheelchair by motor neurone disease.

It tells the story of how Hawking, eldest of four children, with a father who was in research into tropical diseases first went into mathematics and physics.

With his work pushing back theory frontiers to the literal beginning of time for this Universe, it is ironic, the book notes, that Hawking has only looked through a telescope a very few times.

With full and detailed explanations of theories easily understood in intelligent layman terms it is a book which will push you into thinking, and a book which will force you to admire Dr Hawking. Well worth reading.

WG

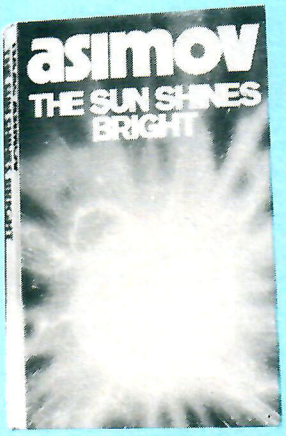
'The Warlock Unlocked' by Christopher Stasheff. Published by Granada at £1.95. Soft covers.

I enjoyed this. I didn't think I would. It hung around on the pile of books to be read and reviewed for some time and kept getting pushed to the bottom. I think it was the cover which did it. Said cover depicts a sort of pig-faced red-haired ogre-thing menacing a long-white-haired, sword-and-shield-and-cape-type with muscles and the legend *the long-awaited third book in the fantastic warlock series*. Enough to put anyone off!

Or perhaps I am perverse. If someone starts telling me that something on the TV is the last thing since Baird or this book is the finest thing in publishing and people have been haunting bookshops waiting for delivery I tend to steer a wide course. (Of course, I probably miss quite a lot that way that is good.)

This tome tells the tale of a lost human settlement where psi powers have developed into the norm through centuries of inbreeding from the original stock. Mixed into this are a rather likeable RC priest, time travel, and parallel universes, which sounds quite a compound, but it produces quite a good adventure story.

WG



'The Sun Shines Bright' by Isaac Asimov, published by Granada at £1.95. Softcovers.

The Doctor's been collecting again! Never one to think that his own words are anything less than

READ OUT

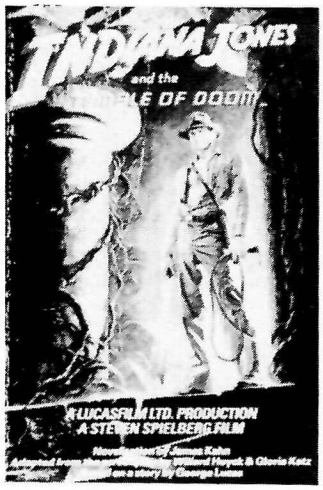
prime prose he's collected 17 of his short articles on such things as the Sun, stars, planets, cells, scientists, and people, scribbled a long introduction, with plugs for other such collections, on how to think up a title and voila – *The Sun Shines Bright.*

Don't get me wrong, I like reading Asimov on fact – I like it very much because he has the ability to explain complex scientific things in language which just about everyone can follow, but I sometimes wonder if he ever actually writes anything – as opposed to collecting it.

If all his writing was laid end to end I suspect it would form a moebius strip round the world and beyond.

This is an interesting dip into science – short, easily digestible essays on all manner of things, but it in no way rivals what I feel is his best factual work – well thumbed in my library – his two volume *Guide To Science* which I will and have recommended to all.

WG



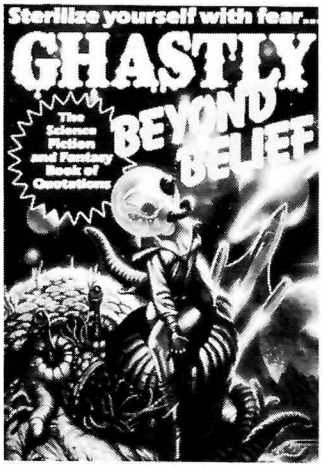
'Indiana Jones and the Temple of Doom' novelisation by James Kahn from the screenplay by Willard Huyck and Gloria Katz. Published by Sphere at £1.75. Soft covers.

Film of the book. Eight colour illustrations with silly captions. This is a nice souvenir for those who've seen the film, but if you haven't you'd never believe that such an outrageous story would ever get into print.

Even more than the first film, it is a concoction of all sorts of mystical mythology, which works on the screen because of the gusto of it all, but it is all a bit harder to taken when written down, simply because with the printed word you have time to pause, re-read and think to yourself *'oh come on, really ... do you expect me to swallow that?'*

I suppose, though, that we have to accept Indiana Jones as rampant swashbuckling and leave it at that.

WG



'Ghastly Beyond Belief' by Neil Gaiman and Kim Newman. Published by Arrow. Softback.

We all know that some SF sets the imagination alight, while some sets the concrete in the boots. This book is a collection of the finest examples of the latter. It will delight the aficionados of the groan. The ones who get a perverse joy from watching the unwatchable, reading the unreadable, the ones who make a cult joy from watching such delights as the classically dreadful *Revenge of the Killer Tomatos* or *Plan Nine from Outer Space*. Pulp SF a-plenty is also featured (I can't call any of my own favourites to mind, but be assured they have crossed the Editor's desk – quickly – and have been reviewed in these pages . . .)

The book, which is due out next month, is a coffee-table sort of a book for any SF fan, you should read it through once, then keep it by you for those moments when you need to reflect that there is always someone who has done something worse – ample selection of examples within. The authors are to be commended on their courage in assembling such a collection, which if nothing else should serve to inspire anyone with aspirations to get into print with their own SF – it couldn't be worse than some of this!

Everything is covered, from the Blurb Paradoxical and Improbable, through Futurespeak and Insults to Double acts and epitaphs, via Monsters and Trailers.

Astute readers will have noticed that one of the compilers is our own contributor Neil Gaiman. This has nothing to do with the fact that I recommend this book without reservation – and Neil, can I please borrow a copy of the oft-mentioned Runts of 61 Cygni C?

WG

'Talisman of Death' by Steve Jackson and Ian Livingstone. Published by Puffin at £1.75.

This, the eleventh tome in the Fighting Fantasy series of gamebooks shows just how well a good idea can last. In fact, the original FF book, 'Warlock of Firetop Mountain', is the only 'children's' book to get into the top 10 adult book charts.

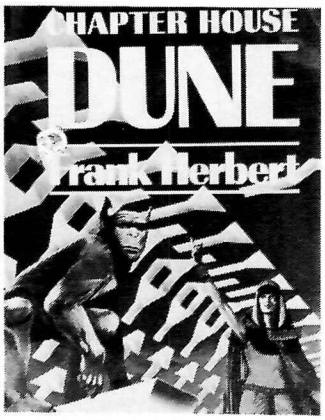
For those of you who are still unfamiliar with the series, the FF books enable the reader to roll up a character, using dice, and progress through the adventure, making decisions and going to the relevant numbered paragraph to discover the outcome – effectively writing your own story.

In 'Talisman of Death', the reader/character has been 'summoned' to the magical world of Orb – a world literally under the threat of Death! If his minions can retrieve the magical Talisman, Lord Death will rise up and lay waste the living world. In view of this, the Guardians of Orb entrust the 'reader' with the task of smuggling the Talisman back to his/her own world beyond the clutches of evil.

Throughout the adventure, I found the usual problems of some situations being almost impossible to get into, and others impossible to get out of. Fortunately in this book it is possible for the same character to cheat death in more ways than one – I'll let you find out how for yourselves.

As with the other books in the series, I found this compulsive reading (gaming?), ideal for long journeys – 'though rolling dice on an Intercity 125 may cause some raised eyebrows – and as a gift for brattish children it is highly recommended.

CR



'ChapterHouse Dune' by Frank Herbert. Published by Victor Gollancz at £8.95. Hardback.

The penultimate Dune, according to Frank Herbert. This episode also deals very much with the Bene Gesserit. Oldrade is now Mother Superior of the order and is conniving, scheming, planning and machinating with the best of her Other Memories.

The Bene Gesserit and Oldrade are most concerned with the threat to the order posed by the Honoured Matres, returning renegades from the Scattering, able to move fast and provide the ultimate orgasm. Worms are back in vogue, though not back on Dune, which has become a backwater cinder of a planet.

Once again, if you loved the others you'll love this, and if you've not read any Dune before, do not, what ever you do, start with this one. You won't understand a word.

Frank Herbert's style is much unchanged, the complications of plot and progression are still there, it is still easy to get lost in the whole thing, and I didn't understand the last couple of pages at all!

WG

Reviewers this issue:

NG	Neil Gaiman
WG	Wendy Graham
AN	Antony Nettle
CR	Chris Richmond

STAR WARES

WANTED

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Model newsletter

A copy of a new newsletter, *Scale Spacecraft* has reached the *Space Voyager* offices, from America. Produced by a hobbyist, it contains news, requests for information and reviews of model kits, as well as model kit listings.

Details from Michael Mackowski, 2136 Northern Limits, Florissant, MO, 63031, USA.

Samurai Wookies

One of the more unusual newsletters of SF fandom which reaches *Space Voyager* is that produced by two Wookies living in England who have become enamoured of the Samurai cult. Bedecked in full costume the two make an imposing sight at conventions and their newsletter is well worth a read. The duo are also behind the Rising Suns convention later this month.

Details from Earth agents Mike Davey, 32 The Glen, Alkrington, Middleton, Manchester M24 1TH, or Eric Letherman, 196 Woodlands Road, Crumpsall, Manchester M8 7QH.

Hawk help

The Hawk Alliance, the Thom Christopher fan club, named for his role in *Buck Rogers in the 25th Century*, has started to give money to the Hawk Trust, of which it has become a supporter. Thom's latest public performance was in *Uncle Vanya* by Chekov, in which he played Astrov. The play was on in Louisville, Kentucky.

Details on Hawk Alliance membership from Chrissie Chrzan, 22 Woodfield Crescent, Kidderminster, Worcestershire DY11 6TX.

ASTRA and ARGO

Meetings have begun between one of Britain's oldest spaceflight societies and one of the new action groups to work on possibilities of future cooperation. Project ARGO is a venture announced at the 1984 meeting of the British Association for the Advancement of Science. Its aim is to conduct social and biological experiments concerning the possibility of settling and terraforming the planet Mars, and to promote the formation of an international, non-military programme for the purpose. Meanwhile in the USA, at the second *Case for Mars* Conference organised by the Planetary Society, detailed planning has begun for a proposed manned Mars mission in the 1990's.

ASTRA, the Association in Scotland to Research into Astronautics (now in its 32nd year of meetings), was represented at Case for Mars II by Duncan Lunan, ASTRA President. In December Lunan met Lord Young of Dartington, the Chairman of Project Argo, and passed on a call from the US Air Force for Mars simulation experiments which could be flown on the Space Shuttle, in a special centrifuge built by Air Force cadets to fit into the 'Getaway Special' standard canister.

It was provisionally agreed that an ASTRA delegation would participate in a Project Argo seminar in Cambridge, scheduled for April or May. The Free Space Society and Space Settlers Group has also been invited. ASTRA has invited Project Argo to participate in its Mars exhibition in Largs, Ayrshire, in the Autumn of 1985.

Captain Kirk Con

British William Shatner fans are holding a one-day convention at the Kenneth Black Memorial Hall, Wimbledon, London on Saturday March 30. Proceeds to the Diamond Riding Centre for the Handicapped. So far the London group, which is organising the get-together has given £500 to the Centre in their year of existence.

Details on the William Shatner Fellowship from Shirley Brek, 158 Westway, Raynes Park, London SW20 9LS.

Harry Harrison club

A Nottingham fan has started an appreciation society for the popular author, Harry Harrison.

Called *Make Room!* the club has been set up with Harrison's approval and its aims are to get fellow fans in touch and to keep up to date with all things relating to the author's work. Details from organiser Paul Tomlinson, 77 Belmont Road, Kirkby-in-Ashfield, Nottingham, NG17 9DY.

McCoy helps research

British fans of DeForest Kelley are helping fund Leukaemia Research by saving and donating used postage stamps. Details on the club – Jacksonville – from Lynn Campion, 92 Thurlow Park Road, West Dulwich, London, SE21 8HY.

Want to go to Mars?

Lord Young of Dartington has gathered several top scientists and others into a new group, the 'Argo Venture', who are trying to raise £400,000 to pay for Mars simulation experiments. One of these will involve around 30 volunteers living in simulated Mars settlement conditions for a year. The main objectives are scientific of course, but it is also hoped that some of the volunteers may prove suitable for an actual Mars mission at a later date.

In support of this, the Space Settlers Society are donating the profits from their Triple-S Con, taking place this July in Cardiff – see ad elsewhere and Con data. Argo Venture personnel will be at the Con and will explain their plans to convention members, and recruit any suitable volunteers.

NEXT ISSUE

Halley-mania

Halley's Comet is coming – or had you heard? Patrick Moore will be filling us in on all the details of this intensely scrutinised return of Ol' faithful. He'll also be writing his special column as Consultant Editor *From An Astronomer's Desk*.

Space Careers

In part three of his series, Andy Nimmo tells us all how to persuade the powers that be to expand space travel and exploration.

The Way Ahead

Geoff Endacott reports on the future for Europe in Space, as well as bringing us his regular Shuttle Update.

IRAS

Dr John Davies concludes his report on the Infrared Astronomical Satellite's 300 days of sky searching.

Anderson 2

Part two of David Nightingale's series looks at some more of Gerry Anderson's output, including *Thunderbirds*.

Davros

Michael Wisher was for some time a regular in *Dr Who*, supplying Dalek voices, acting in a variety of different roles, and finally creating the character of the creator of the Daleks, Davros. He passes on some anecdotes of times with Jon Pertwee and Tom Baker.

Soyuz T-10

Cosmonauts Kizim, Solovyov and Atkov spent a record 237 days in space, and were visited by two other crews, including the first Indian spaceman and the first woman spacewalker. Ian Graham discusses the mission and its implications.

The Invaders

The old TV series, being re-shown at present, is reviewed. What were its failings, did it have failings, what was it all about?

And More!

There'll be news from the world of space travel, astronomy, SF films, books and TV, modelling reports, both of kits and scratch-building, product reviews, and lots of book reviews, plus your letters and news and queries answered.

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